

## MILITARY MEDICINE

### ORIGINAL ARTICLES

Authors alone are responsible for opinions expressed in their contributions

## Safeguarding Service Health\*

By

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PRIOR to the 19th century, the art of military medicine was crude—prevention of disease was ineffective; treatment was inefficient and burdensome. As a result, military commanders "wrote off" the sick and injured as an unavoidable loss, to be replaced by recruits. Replacement was relatively easy; the military man needed few skills not normal to his everyday life. As history records, however, this lack of concern for the health and well being of military manpower was disastrous in many campaigns.

Since the advent of gunpowder warfare has become increasingly complex. An ever growing proportion of military manpower has had to acquire highly technical skills to use weapons having no counterpart in civil life. Today the typical fighting man is a technician with knowledge acquired through months, and sometimes years, of expensive, exacting training. Today the military commander can no longer recruit battle-ready men direct from civil life. Maximum salvage of trained military manpower has become essential to combat readiness and effectiveness. An injured radar man can be returned to duty, even though he may require months of hospitalization, sooner and more economically than he can be replaced by a recruit.

The development of military medicine has

kept pace with these advances in military operational techniques and requirements. From its crude beginnings when little more than comfort could be given to the sick and dying, military medicine has become a complex art and science dedicated to the conservation of military manpower.

Modern military medicine has an accepted interest and responsibility in all military activities involving personnel to get the best man for the military job and to keep him at that job. The military physician screens all persons coming into the Armed Forces to assure that only the physically, mentally and psychologically fit are accepted. The physician conducts active disease and accident prevention programs which include immunization against disease, development of safety clothing and devices, training in personal hygiene, and supervision of food services, clothing, living quarters and recreation. When a man is sick or injured he is given the best medical treatment whether he is at home or in a remote corner of the world; in peace or in war. If he becomes unfit for further duty, he is removed from the active rolls to avoid a hazard to other personnel and further harm to himself. Following discharge, certain classes of personnel continue to receive needed medical care from either the Armed Forces or the Veterans Administration.

To provide this high quality of service for the military man throughout and following his discharge from military life, the

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Armed Forces medical departments conduct several uniquely military activities. For example, the physiological and psychological effects of stress in military environments are the subject of major research and development studies. At the Naval Submarine Base, New London, Conn., the environment studied is the nuclear-powered submarine submerged for prolonged periods; at the Aero-Medical Laboratory, Wright-Patterson Air Force Base, Dayton, Ohio, the environment is the vehicle in space.

The physician, skilled in the healing art, is taught to practice this art under field combat situations in the Army Medical Field School, Fort Sam Houston, Texas, and the Naval Medical Field Service School, Marine Corps Base, Camp Lejeune, North Carolina. Medical technicians are taught the skills required to assist the military physician in his practice of military medicine in special schools, such as the Hospital Corps School, U. S. Naval Hospital, San Diego, California. These technicians serve in all types of medical activities including the air evacuation service, army field dispensaries, food service activities and large military hospitals. Some become so highly trained and so proficient that they are assigned to "duty independent of a medical officer" and serve as the "medical department" for small military units.

These activities are conducted primarily to keep military personnel fully active, strong

and fit. However, military medicine does not isolate itself. In order to keep abreast of all developments having military application, the advice and counsel of civilian consultants in all health and medical fields are obtained on a regularly established basis. Professional and technical military personnel attend courses of instruction in civilian medical schools and participate actively in civilian medical and technical associations and other activities.

The Armed Forces do not benefit exclusively from this interplay between civilian and military medicine. The Department of Defense, for example, sponsored the program of "Medical Education for National Defense" in which students in 55 medical schools are receiving instruction now in military and disaster medicine as part of their regular curricula. The Armed Forces Institute of Pathology has made lasting contributions to medical knowledge of disease processes. Research and development undertaken initially to solve military medical problems have enlarged the general medical armamentarium. The victory over yellow fever, treatment of the severely burned, and techniques for processing and using blood and its derivatives are only a few examples of how the military medical services—in pursuit of their primary mission, conservation of the fighting man—pay a double dividend to the Nation.



### POLIO IS ON THE INCREASE VACCINATE NOW

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"The health, the happiness, and indeed, the lives of many thousands of Americans are being jeopardized through failure to take advantage of the polio vaccine."

ARTHUR S. FLEMMING, *Secretary of Health, Education, and Welfare*

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VACCINATE

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# Temporary Cavity Effects Accompanying Wounding by High Velocity Missiles\*

## Effects of Trauma on Striated Muscle as Observed by the Electron Microscope

By

MAX KRAUSS, PH.D.

(With eight illustrations)

### INTRODUCTION

THE development and decay of a relatively large temporary cavity within 5 to 10 milliseconds following passage of a high velocity missile through media such as water, gelatin, and animal soft tissue is of particular interest in connection with problems associated with missile wounds in human beings. One of these problems has to do with the extent of damage to tissue surrounding the missile tract, or permanent cavity. It is generally assumed that the rapid radial acceleration of tissue components, with concomitant stretching and tearing, which occurs in temporary cavity formation is responsible for the "damage at a distance" which characterizes high velocity missile wounds in contrast to those produced by low velocity projectiles.<sup>1</sup>

The nature and extent of damage to various kinds of tissues which might be attributable solely to temporary cavity formation, for the most part remains to be resolved. It is known that a long bone such as the femur may be fractured even though it is not struck directly by a high velocity missile which penetrates the surrounding muscle. Elastic structures such as larger blood vessels and nerves appear, grossly at least, to be relatively unharmed if not directly hit. In the case of nerves, however, it was shown that functional damage could result from the passage of a high velocity missile that did not strike the nerve directly.<sup>2,3,4</sup> Impaired conduction in the sciatic nerve of cats was shown by Puck-

ett et al.<sup>5</sup> to result from near misses, when, as revealed by microsecond-exposure roentgenograms, the nerve was rapidly blown aside during expansion of the temporary cavity.

In the case of striated muscle it is difficult to demonstrate by means of conventional histological methods whether fibers are significantly damaged by displacement accompanying temporary cavity formation. Even irreversible injury to muscle fibers may not be demonstrable by such means immediately following wounding. It might be expected that destructive disorganization of muscle fiber structure would be manifested by abnormal changes in birefringence. It is well known that both intrinsic and form birefringence of striated muscle fibers decrease during isotonic contraction.<sup>5</sup> In pathological conditions, involving more or less extensive disorganization of the muscle structure, correspondingly large decreases in birefringence may be observed. Developing rigor mortis, for example, is accompanied by a consistent decrease in birefringence.<sup>6</sup> Existing evidence concerning changes in birefringence in muscle fibers in the region in which a temporary cavity has existed is inconclusive.<sup>7</sup>

Current efforts in this laboratory are being directed to delineating by means of electron microscopy structural alterations in striated muscle which has been subjected to wounding by high velocity missiles.

Recent advances in knowledge of the fine structure of striated muscle, which have been achieved with the electron microscope, show that the contractile structure consists of a double set of longitudinal filaments in each sarcomere, which overlap in certain regions

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to produce the characteristic band pattern.<sup>8</sup> Electron micrographs of thin sections of normal striated muscle from a variety of species are characterized by a remarkable regularity in the alignment and spacing of the myofilaments, particularly in the A band.<sup>8,9,10,11</sup> Cross-bridges between the myofilaments occur at regular intervals of about 400 Å.<sup>8</sup> Huxley<sup>8</sup> has suggested that these bridges are sites of ATPase activity and hence are intimately involved in the contraction process.

Associated with the contractile elements of striated muscle is a network of vesicles and tubules comprising the sarcoplasmic reticulum.<sup>9,12,13,14,15</sup> Porter and Palade<sup>15</sup> have suggested that this network may be concerned in the channeling of metabolites to the myofibrils and also that it may provide a pathway for the transmission of the wave of action potential which is thought to trigger the contraction mechanism.

The present paper is a report of some observations that have been made concerning the effects of temporary cavity formation on the contractile components (myofibrils and myofilaments) of striated muscle fibers.

#### MATERIALS AND METHODS

Samples of muscle were obtained from the edge and from distances of 5, 10, 20, and 50 mm from the edge of wounds made by high velocity .30 caliber rifle bullets either in the posterior thigh musculature of anesthetized goats or in freshly excised goat leg muscles. All samples were obtained and fixed within 15 minutes following wounding. A large temporary cavity is known to be produced under the conditions of wounding employed in this investigation.

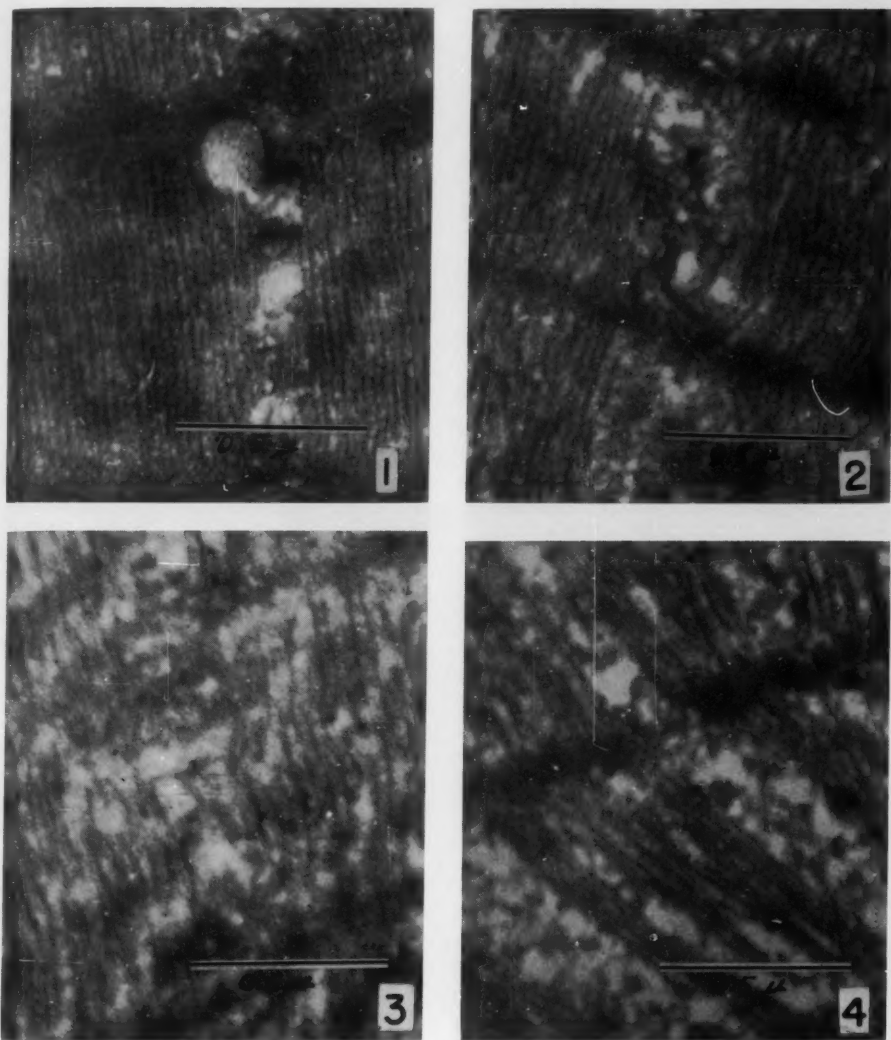
Fixation was accomplished in ice-cold chrome-osmic acid mixture.<sup>16</sup> Samples were small enough (not more than 1 mm in any dimension) so that penetration of the entire sample by fixative occurred rapidly. Following fixation and dehydration to 95% alcohol, the pieces of muscle were soaked in 95% alcohol containing 1% phosphotungstic acid for as long as 48 hours. Embedding was accomplished in 9:1 butyl-methyl methacry-

late mixture which was polymerized at 70-75°. Sections were cut with a modified Porter-Blum microtome using glass knives, and were mounted either on formvar-coated copper grids or, in the later phases of the investigation, on carbon films evaporated onto EFFA grids. The sections were examined with an RCA EMU 2A electron microscope equipped with a 2 mil objective aperture.

#### OBSERVATIONS

Disturbance of the normal muscle architecture was noted mainly in samples taken from the edge of the permanent cavities. Even in these samples, however, extensive areas were regularly observed in which the myofibrils did not appear to differ in morphological aspect from those in a comparable state of contraction as seen in control sections of unwounded muscle. Figure 1 shows a portion of a sample of muscle from the edge of a wound tract which exhibits the highly regular alignment of myofilaments that is typical of normal contracted striated muscle. The remaining figures show varying degrees of departure from this condition. Most frequently noted in the present material is a loss of order in the normally regular array of myofilaments. Figure 2 shows a field in which the alignment of the myofilaments is only slightly less regular than is seen in figure 1. Figure 3 shows a field in which disturbance of filament alignment is somewhat more pronounced. In this figure the interfibril spacing appears generally to be greater than is seen in samples of unwounded muscle. It seems safe to suggest that separation of myofilaments to the degree seen here may involve rupture of interfibril cross-bridges, or, at the least, disturbance of the normal filament-cross-bridge relations. More extreme separation of myofilaments is shown in figure 4. Figure 5 shows a field in which the myofilament array exhibits a relatively high degree of disorder, and in figure 6 the myofibrils present a shredded appearance with numerous filaments apparently having been torn away from the main mass of the fibrils.



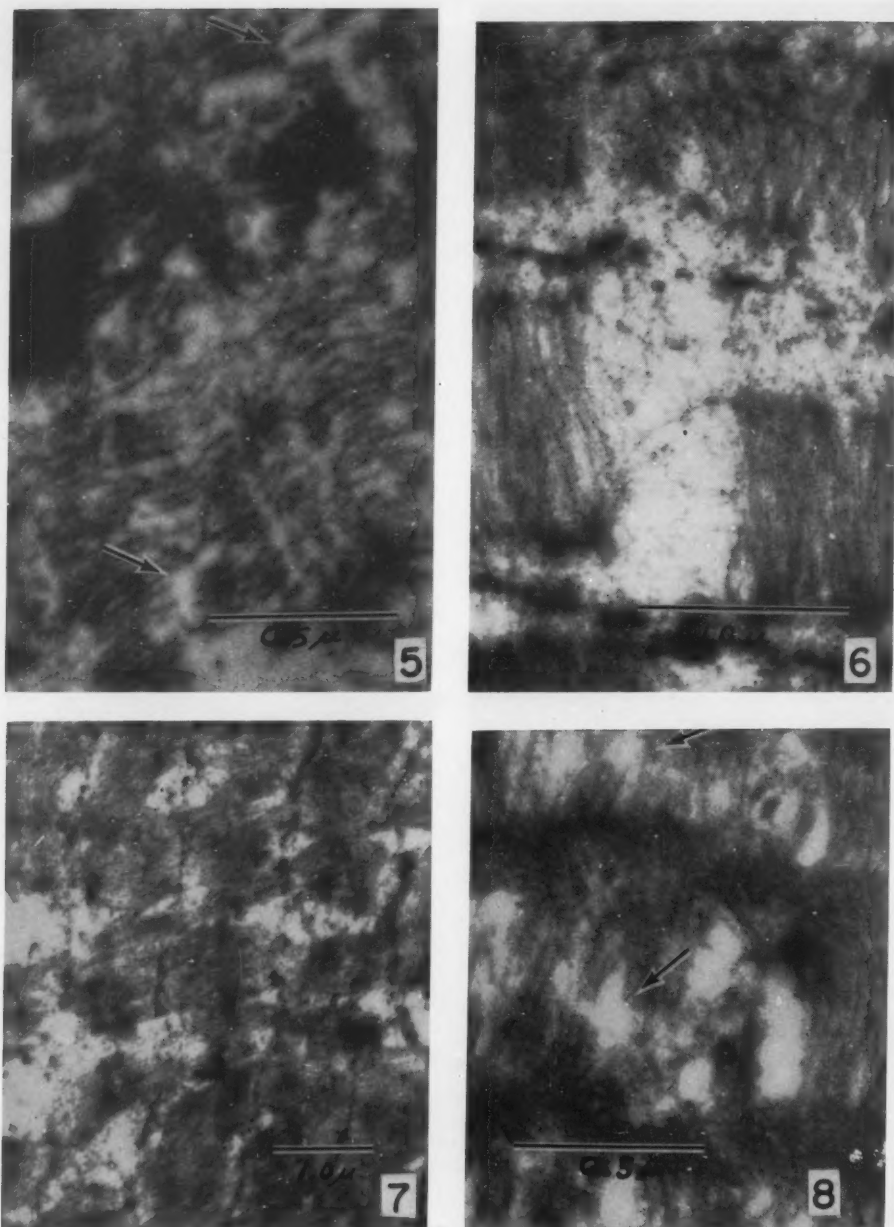


FIGS. 1-4. Representative fields in samples from the edge of wound tracts in muscle.

1. Myofilaments in regular alignment characteristic of normal muscle.
2. Myofilaments showing slight irregularity in alignment.
3. Abnormal spacing between myofilaments and irregularity in alignment.
4. Myofilaments separated laterally to a degree that presumably would involve rupture of cross-bridges.

Disruption of interfibrillar components of the muscle fibers, involving structures that normally appear to form connections between the myofibrils, is illustrated in figure 7. This is a low magnification picture of a field at the very edge of a missile tract, which is

seen in the upper right-hand corner of the figure. Remnants of interfibrillar connecting material can be seen in the spaces between myofibrils near the edge of the permanent cavity. It may be noted here that even a slight disturbance of the contractile elements



FIGS. 5-8. Additional fields in samples from the edge of wound tracts in muscle.

5. Myofilaments showing considerable disorder. Arrows point to possible breaks in myofilaments.
6. Myofibrils appear shredded with wide separation between fibrils.
7. Fibrils are widely separated with evident disruption of interfibrillar components.
8. Myofibrils with abnormally dense contraction bands. Arrows point to possible breaks in myofilaments.

may be accompanied by some degree of derangement of the surrounding sarcoplasmic components.

While loss of orderliness in the array of myofibrils and myofilaments, involving varying degrees of separation of these structures, is the most generally observed manifestation of damage in samples from the edge of wound tracts, occasionally areas are found in which myofilaments appear broken transversely. Possible transverse breaks in myofilaments are indicated in figures 5 and 8. In some cases, the appearance of a transverse break may be given by a filament going out of and coming back into the plane of the section, or of a filament leaving the plane of the section and another entering near its termination in the same perpendicular plane. Where the majority of filaments in a section or field can be seen to run continuously the length of a sarcomere, however, discontinuities in some of the filaments, such as are shown in the figures, may very well represent actual breaks.

In view of the nature of the material and the way in which samples were obtained, without any effort being made to maintain a fixed length of the muscle fibers, it was anticipated that the majority of sarcomeres as seen in the electron microscope would be in a contracted condition. Dense accumulations along the Z-lines (contraction bands) were consequently commonly observed. Abnormally heavy contraction bands, indicative of extreme contraction such as might be expected to occur following trauma, were, however, seen only occasionally. Figure 8 shows a field in which the contraction bands appear unusually heavy. In this field there can also be seen a number of places in which myofilaments appear to be broken transversely. It is of interest to note here that the field shown in figure 6, which certainly exhibits what must be a profound degree of disorder in the myofilament array, is also characterized by the fact that the sarcomeres are nonetheless in a relatively relaxed condition.

#### DISCUSSION

Harvey et al.<sup>17</sup> define a region of primary damage surrounding a wound made by a high

velocity missile in tissue as being within the limits of the observed stretching and tearing caused by expansion of the temporary cavity. These authors consider that the presence of extravasated blood around the permanent missile tract is indicative of primary damage in this region. Depending on the conditions of wounding, extravasated blood may be observed, at least microscopically, at a distance of many millimeters or even centimeters away from the permanent cavity. In a recent paper Krauss<sup>18</sup> has expressed doubt whether the presence of extravasated blood is adequate evidence of primary damage to striated muscle.

The presence of retraction clots in skeletal muscle that has been subjected to trauma would appear to be a more definitive criterion of primary muscle damage. Speidel<sup>19,20</sup> has described in elaborate detail the formation of retraction clots in living muscles of a number of species following injury produced by a variety of means, e.g., cutting, heat, chemical irritation, electric shock, etc. According to Speidel, the clotting reaction involves the accumulation of cross-striation material in relatively hard and resistant "coagulation compounds." Speidel's figures show that in fibers in which multiple clots are formed, there may be a complete absence of cross-striations in the intervals between clots.

In the present study, in the course of which many samples from a number of missile wounds have been surveyed with the electron microscope, not a single formation has been seen which could reasonably be interpreted as a retraction clot of injury. Furthermore, no indication of loss or degeneration of cross-striations has been noted in any sample. Speidel recorded the appearance of well-formed clots 10 and 15 minutes after injury. The process of clot formation is fast enough, therefore, to justify the assumption that it would be evident within the times involved between wounding and sampling in the present study. The severity of injury necessary to produce a retraction clot cannot be defined in quantitative terms on the basis of Speidel's work. He noted, however, that a clot may be induced readily at the middle of a fiber by a slight injury to ad-

jacent tissues, such as a wound caused by inserting a microneedle through the skin. Furthermore, Speidel observed that clots may be induced to form in excised muscle fibers by relatively mild procedures such as teasing, stretching, and mounting in Ringer's solution. On the other hand, clotting was also induced by the application of strong electric shocks which resulted in powerful contractions of the muscle fibers. While some clots were observed to disappear within a few minutes, others lasted as long as two days. The length of time a clot persisted seemed to depend upon the severity of the injury.

The absence of retraction clots in the present material as examined with the electron microscope is not easily reconciled with the older observations made on both living and fixed material with the light microscope. Insofar as the question of the nature of primary structural damage to striated muscle surrounding a missile wound is concerned, however, the electron micrographs presented here reveal direct evidence of disruption of the fundamental contractile components of the muscle cell. Separation of myofibrils and of myofilaments probably involving more or less severe disturbance of associated sarcoplasmic elements as well as of the normal cross connections between both fibrils and filaments, plus some transverse breaks in the contractile structures, certainly must have profound functional consequences.

Before turning to the possible functional significance of the observed structural damage, it is of interest to consider the fact that damage to the contractile components was noted mainly in samples which were taken from the edge of the permanent missile tracts. It seems safe to say that direct structural damage to the myofibrils and myofilaments of striated muscle is concentrated in a thin layer surrounding the permanent cavity. In the wounds considered here, this layer may be as much as but probably not more than 5 mm thick. Data obtained in connection with another investigation<sup>21</sup> but which are pertinent here indicate that the temporary cavities associated with the wounds under

consideration had a maximum lateral expansion of about 30 mm. It seems clear, therefore, that the region in which primary structural damage to myofibrils and myofilaments is found by no means coincides with the total volume of material which was displaced in temporary cavity formation. If cross-section area rather than volume is considered then a simple calculation shows that the maximum cross-section area of a region of primary damage 5 mm wide (where the permanent cavity radius is about 5 mm or a little less) is less than one-tenth that of a temporary cavity with a radius of 30 mm. Actually, the difference is probably even greater because very little if any damage was noted in samples taken from as far as 5 mm from the edge of the permanent cavity.

The concept of a relatively thin shell of primary damage to contractile structures in the region immediately surrounding a high velocity missile wound in muscle, and extending radially only a small fraction of the distance through which the temporary cavity expanded, receives support from consideration of the dynamics of temporary cavity formation. Calculations from available data<sup>22</sup> show that during formation in muscle of a temporary cavity with a maximum cross-section radius of 30 mm, an initial acceleration of upwards of  $1000 \times g$  may be imparted to material which subsequently constitutes the innermost layer of the wall of the permanent cavity. Deceleration is very rapid, however, so that in a matter of only 200 microseconds the same material is subjected to an accelerating force of only about 1 g. In 200 microseconds the expanding wall of the temporary cavity has advanced about 15 mm. Calculation of the acceleration imparted to material located laterally to that which will form the wall of the permanent cavity is difficult, and all that can be said here is that it diminishes rapidly with distance from the bullet path.

The total amount of energy absorbed by a mass of muscle 3.5 cm thick (average thickness of the goat rectus femoris) from a stable .30 caliber rifle bullet weighing 10 gm

and having an impact velocity of 850 m/sec (2790 ft/sec) is of the order of  $50 \times 10^7$  ergs (37 foot-pounds). This is less than 2% of the total kinetic energy of the bullet. If more energy is delivered to the muscle, as by increasing the impact velocity of the bullet, the region of primary damage to contractile components in the surviving muscles is not necessarily increased correspondingly. For example, wounds have been produced in the goat rectus femoris muscle with a 10 gm bullet having an impact velocity of 1280 m/sec (4200 ft/sec). The total energy absorbed by a muscle 3.5 cm thick in this case is about  $150 \times 10^7$  ergs (111 foot-pounds), or three times as much as at a velocity of 850 m/sec. Electron microscope examination revealed structural damage, however, only in samples obtained at or very near the edge of the permanent cavity.

An explanation of the apparently paradoxical situation revealed here appears reasonably simple. Thus, although the temporary cavity produced by a 10 gm bullet with an impact velocity of 1280 m/sec may be 2 to 3 times as large as that produced at 850 m/sec, the permanent cavity is correspondingly larger.<sup>19,21</sup> Within the region immediately surrounding the advancing bullet, the tissue is subjected to stresses of such magnitude that it is disintegrated and it is blown out of the mass<sup>23</sup> leaving a void, which is the permanent cavity. The wall of the permanent cavity can be thought of as a boundary surface separating a region in which the stresses exceeded a critical level for disintegration (permanent cavity) from the region of surviving muscle in which the applied stresses did not attain this critical level. The fact that the degree of structural damage to the contractile elements observed in samples taken from the edge of a permanent cavity frequently appears to be slight suggests that the stress threshold for disintegration is quite sharp. Possible damage to components other than the myofibrils and myofilaments may of course occur beyond the limits of visually evident structural damage to these elements. It may turn out that a magnitude of stress

that produces no visible damage to the contractile structures may be sufficient to cause more or less profound disruption of other muscle cell constituents. In this connection it should be pointed out that vascular structures of the capillary bed must be relatively more susceptible to damage than the contractile components of muscle. This is indicated both by the presence of extravasated blood at some distance from a wound tract and by the ensuing onset of more or less widespread degenerative changes in wounded muscle which can reasonably be attributed to interruption of the normal blood supply.

In considering the question of the degree of functional impairment that may be associated with the observed structural damage to myofibrils and myofilaments, the main problem concerns the effect of disrupting interfibrillar connections between myofibrils and cross-bridges between myofilaments. Huxley and Taylor<sup>24</sup> have suggested that interfibrillar connections, such as appear to be formed by Z and M line material,<sup>25</sup> may constitute pathways for intrafiber conduction. As noted in an earlier section of this paper, a similar suggestion has been made with respect to the sarcoplasmic reticulum. Stretching, tearing or breaking of interfibrillar and sarcoplasmic structures could then be expected to have a direct effect on conduction of the wave of action potential which is thought to initiate contraction.

If, as proposed by Huxley, the cross-bridges connecting primary and secondary myofilaments are sites of ATPase activity, disruption of them could be expected to have a profound effect on interaction between the primary and secondary filaments, which is the basis of the Huxley-Hanson interdigitating scheme of muscle contraction.<sup>26</sup> Thus, not only could the observed structural damage involving myofibrils, myofilaments, and their cross-connections interfere seriously with normal functioning of conduction pathways within the muscle, but it could also affect the capability of the muscle to contract by interfering with essential interactions at the molecular level.



## ACKNOWLEDGMENTS

I am indebted to Dr. F. W. Light, Jr, for the interest he has shown in this investigation, for his continuing encouragement and support, and particularly for his elucidation of physical and mathematical problems associated with the analysis of temporary cavity phenomena. I also wish to express my indebtedness to Mr. W. R. Van Antwerp for his invaluable assistance in the use of the electron microscope.

## SUMMARY

1. Examination with the electron microscope shows that damage to the contractile components of striated muscle in samples taken within 15 minutes after wounding and at varying distances from the edge of a high-velocity missile tract is found within 5 mm of the edge of the permanent cavity and mainly at the very edge of the tract.

2. The observed damage consists mainly of loss of orderliness in the array of myofibrils and myofilaments, involving varying degrees of separation of these structures with occasional transverse breakage of myofilaments. Abnormally heavy contraction bands are sometimes seen but no formations that could be interpreted as retraction clots have been found.

3. Separation of myofibrils and myofilaments probably involves more or less severe disturbance of cross connections and of associated sarcoplasmic components of the muscle cell.

4. The electron microscope observations are supported by independent considerations in indicating that structural damage to the contractile components of striated muscle from temporary cavity formation accompanying wounding by high velocity missiles occurs mainly in a thin shell immediately surrounding the permanent cavity and extending radially only a small fraction of the distance through which the temporary cavity expanded.

5. It is suggested that there is a sharp threshold for disintegration of striated muscle and that the wall of the permanent cavity

represents a boundary between a region in which the level of applied stress has exceeded the disintegration threshold (permanent cavity) and a region in which it has not (surviving muscle).

6. The observed structural damage could interfere seriously with normal functioning of conduction pathways within the muscle fibers and it could also affect the capability of the muscle to contract by interfering with essential interactions at the molecular level.

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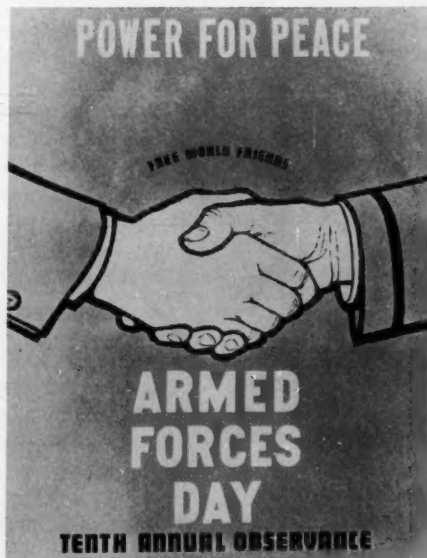
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# The Initial Effort to Immunize American Soldier Volunteers with Typhoid Vaccine

By

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**T**HE history of typhoid vaccination in the United States Army began in May 1904 when James Carroll, then a First Lieutenant and Director of Laboratories at the Army Medical School, proposed the vaccination of soldiers by the oral administration of dead typhoid bacilli."

These are the opening lines of a manuscript submitted originally for clearance in 1935 by Edward B. Vedder, Professor of Pathology and Preventive Medicine of George Washington University. Since the episode, until then a carefully unrecorded secret, had been briefly mentioned by Surgeon General Robert U. Patterson at a section meeting of the American Public Health Association in 1934,<sup>1</sup> Professor Vedder hoped that this important, and otherwise unknown study, could be published in full. However, under date of December 9, 1935, publication was denied "for reasons of public policy."<sup>2</sup> There is one further brief published reference in 1934 as a part of a biographical sketch of one of the participants<sup>3</sup> and a manuscript almost identical to that of Vedder's is on file at the National Library of Medicine.<sup>4</sup>

This study, representing the initial effort to develop an oral vaccine for typhoid, actually eventuated in proving the validity of Koch's postulates in a quantitative fashion with respect to the causative agent of typhoid fever in man. In the half century since this episode no further significant data of this sort has been reported and for this reason alone the study should be a part of the medical literature. In addition, however, the principal participants were three of the great names of American military medicine—Carroll, Vedder and Gilchrist.

James Carroll,<sup>5a</sup> born an Englishman, en-

tered the American Army as an enlisted man at the age of 20 in 1876. While serving as a hospital steward he completed a medical education, receiving his M.D. from the University of Maryland in 1891. During the next two years he continued studies under Welch at the Johns Hopkins. This was followed in 1893 by an assignment to the newly formed Army Medical School as Walter Reed's assistant. His first recorded contact with the laboratory aspects of typhoid fever was in the support of the Reed-Vaughn-Shakespeare Board for the Investigation of Typhoid during the Spanish-American War.<sup>6</sup> As a contract surgeon in Cuba and a full member of the Board for the Investigation of Yellow Fever, he was the initial volunteer to develop clinical yellow fever following a bite by a *Stegomyia* mosquito (August 31, 1900).<sup>7</sup> Carroll recorded later that his emotional reaction during the clinical disease was strongly colored by thoughts of his wife and five small children at home.<sup>5b</sup> It is considered by some that his death in 1907 was a direct aftermath of this attack of yellow fever. In 1901, working alone in Cuba, he conclusively showed by further studies in volunteers that the causative agent of yellow fever was filterable and that heat to 55°C. for ten minutes renders the serum non-infectious.<sup>8</sup> This was accomplished without any loss of life and was initiated under considerable difficulty because another program of study of yellow fever in Cuba (Guiteras)<sup>9</sup> had resulted in several fatalities.

He was appointed professor of bacteriology and clinical microscopy at the Army Medical School upon the death of Walter Reed, November 23, 1902 and it was in this capacity that he undertook the study on typhoid to be reported in this paper.<sup>10</sup> Major Carroll died on September 16, 1907.

Edward B. Vedder, a graduate of the

\*The Walter Reed Army Institute of Research, Washington, D.C.

Army Medical School in 1904 was selected as Carroll's assistant, and it is his account of these studies that is to be given here. In later years he was to demonstrate that beriberi was a deficiency disease, that the syndrome could be cured or prevented by including half-polished rice in the Filipino's staple diet, to make observations leading to the discovery of ascorbic acid, to make important studies in the infectious diseases, and to undertake basic studies in chemical warfare. He became Commandant of the Army Medical School in 1930. After retirement from the Army he was, for ten years, Professor of Pathology at George Washington University Medical School. Colonel Vedder died on January 30, 1952.<sup>12</sup>

Harry L. Gilchrist, the third member of this group entered the Army in 1898, saw service in the Philippines and had been Health Officer of the City of Manila during 1900 and 1901. He was a member of the Army Medical School class of 1902-1903, receiving the Hoff Medal in recognition of his scholastic attainments. At the time of these studies on typhoid he was a staff member of Company of Instruction No. 1, attached to the U. S. Army General Hospital at Washington Barracks (present Fort Leslie J. MacNair). Later in his career Gilchrist was to participate in the relief expedition to the San Francisco earthquake disaster, to have the field responsibility for treatment of chemical warfare casualties in World War I and to spend two years as Commanding Officer of the American Typhus Relief Expedition to Poland. In 1920 he was made Chief of the Medical Service of the Chemical Warfare Service and was responsible for the Medical Laboratories at Edgewood for the next nine years. In 1929 he was made Chief Chemical Officer of the U. S. Army. On his retirement he served a term as President of the Association of Military Surgeons and then was Secretary for a period of years. Maj. General Gilchrist died December 26, 1943.<sup>3, 12</sup>

In 1904 the American Army was only too keenly aware of the importance of typhoid fever. During the Spanish-American War

at least one of every five soldiers had developed typhoid fever. From a study of these 20,738 cases the Reed-Vaughan-Shakespeare Board<sup>6</sup> had convincingly demonstrated the danger of feces from cases of typhoid fever. The danger of spread from mild or "walking" cases of typhoid was recognized but the full significance of the carrier state was not appreciated.

Even in the peacetime army of 1904 the rate was 5.14 per thousand per annum.<sup>13</sup> Under these conditions the disease was one of recruits, more than one-half of the cases occurring in soldiers with less than one year of service.<sup>14a</sup> Hygiene was a new infant science. The following comments from the Report of the Surgeon General for 1905 speak for themselves "... the study of military hygiene ... at the Military Academy of West Point ... should be a part of the regular course. ..." "Even on the march pure water can be supplied." "The issue of toilet paper is now authorized where posts have sewer connections."<sup>14b</sup> British reports are even more succinct. Hayes<sup>15</sup> in describing an outbreak in Reading mentions that the mops used in the urinals were also used to wipe the barracks-room table tops. There was truly "immunization by acclimatization" and good reason to seek for some artificial method of meeting this problem.

Following Wright's work on typhoid vaccine inoculation, initiated in 1896, the British Army had employed the procedure during the Boer War of 1900-03 on a volunteer basis. The results were confusing and the procedure was discredited by the Medical Advisory Board headed by Broderick.<sup>16</sup>

These were the circumstances surrounding the study in the American Army initiated by James Carroll and here recorded by Vedder<sup>2</sup> and confirmed by Gilchrist:<sup>4</sup>

"The history of typhoid vaccination in the United States Army began in May 1904, when James Carroll, then a First Lieutenant and Director of Laboratories at the Army Medical School, proposed the vaccination of soldiers by the oral administration of dead typhoid bacilli.

"The method of producing the vaccine was as follows: A one liter Erlenmeyer flask

of ordinary nutrient bouillon was inoculated with *B. typhosus*. The Dorset strain was used, named for a fatal case occurring in 1898 during the Spanish-American War, from whom the organism was isolated. The flask was incubated for six days, or until a heavy visible growth had occurred. The organisms were then killed by heat, the lowest possible temperature being desired in order not to destroy antigenic power. Sternberg's Textbook of Bacteriology, the leading authority, gave the thermal death point as 56°C. for ten minutes, and the flask was accordingly placed in an incubator in which the temperature was maintained at 56°C. for one hour. Thereafter the flask was incubated for a week at the usual temperature of 36°C. for the purpose of producing autolysis of the dead bacteria, after which time it was tested for sterility by plating one cubic centimeter lots of the material, and was placed in an ice box until used.

"The first experimental work with this vaccine was on a series of six rabbits and six guinea pigs. The vaccine was administered by a stomach tube. The rabbits were given 10 c.c. at first once a week, the dose being increased later to 25 c.c.; the guinea pigs received from 5-10 c.c. During the course of the experiment, daily erythrocyte and leucocyte counts were made. These counts were at all times within normal limits. Blood was also taken at least once a week to test for agglutination microscopically. Agglutination occurred early, and after four or five doses attained titers varying from 1-1200 to 1-2000. This proved that an immunity reaction was produced as the result of intestinal absorption.

"The results were so suggestive that the matter was taken up by Lieutenant Carroll with the Surgeon General of the Army with the recommendation that volunteers be called to take this typhoid vaccine. The Surgeon General then communicated with Lieutenant H. L. Gilchrist of the Company of Instruction No. 1, with reference to obtaining the necessary number of volunteers. This was done on the following Saturday (July 9, 1904) when the entire organization was lined up for inspection.

"Before the call was made, its nature was carefully described, following which some fifty men volunteered to participate in this experiment. Inasmuch as but ten were desired, the First Sergeant was instructed to pick out every fifth man so as to avoid any suspicion of selection. The following volunteers were selected:

Lieut. James Carroll  
Lieut. Harry L. Gilchrist  
Lieut. Edward B. Vedder  
Sergeant Joseph I. Howe  
Private William E. Lumley  
Private George Dunn  
Private George C. Williams  
Private George S. Ward  
Private Robert A. Eisemann  
Private Merl Clifford  
Private William J. Epps  
Private Claud W. Powell  
Private Robert E. Bowman

These men were then instructed to report at 2:00 P.M. on July 12, 1904.

"On the morning of the above date, the First Sergeant reported to Lieutenant Gilchrist that the men who had volunteered to participate in this test had requested to be relieved. It appeared they had a presentiment that something was going to happen. They were instructed to report to the Dispensary at the appointed place, day and hour and then if they wished to be excused, they could do so at that time.

"In view of the misapprehension on the part of the men concerning this experiment, after they were assembled Lieutenant Carroll explained to them the value of the work in which they had volunteered to participate, and what the experiment, if successful, would mean not only to the Army but to the world at large. At the same time he said that although every known precaution was taken in the preparation of the vaccine, and tests on animals had shown it to be harmless, he could give no assurance that there would not be some reactions, but it was his opinion that they would not be serious.

"In order to encourage the men to carry out this experiment Lieutenants Gilchrist and Vedder first took doses of the vaccine larger than those prescribed. Following this, the men lined up and each took 30 c.c. of the typhoid vaccine prepared as described above. The bouillon vaccine was measured exactly, and then poured into a glass of water and swallowed. The men were instructed to report back in ten days for the second dose.

"Two days later a section of the Company of Instruction No. 1 to which these men belonged, and commanded by Lieutenant Gilchrist, marched from Washington Barracks, D.C. to Gettysburg where the organization went into camp in connection with the training of the National Guard of the State of Pennsylvania.

"Since the administration of the typhoid

vaccine required three separate doses at ten day intervals, the vaccine for Lieutenant Gilchrist, Sergeant Howe and Private Dunn, the only three volunteers on the march, was sent to Gettysburg where it was taken by the above named persons. Lieutenants Carroll and Vedder took their second dose at the Army Medical School.

"The history of these men follows:

"(1) Lieut. James Carroll—Had suffered from typhoid fever some years earlier. He remained well.

"(2) Lieut. Harry L. Gilchrist—While in camp at Gettysburg he became ill during the latter part of July. At first no attention was paid to his general weakness and malaise, but about August 3rd severe headaches developed, followed by chills, diarrhoea and a continuous elevation of temperature, ranging from 99.5°F. in the morning to 102.0°F. or 103.0°F. at night. He remained on duty for several days until he became too ill to continue. He was then hospitalized in the hospital of the command. He remained there until August 28th, when he was transferred to Washington and admitted to the General Hospital. He was returned to duty Sept. 11, 1904, with the diagnosis of paratyphoid fever, the latter diagnosis being made for the reason that rose spots and one or two other symptoms common to typhoid fever were absent.

"(3) Lieut. Edward B. Vedder—Taken sick about August 2nd, with headache, constipation and general malaise, but continued on duty until August 6th when he was obliged to go to bed with temperature 101.0°F. A.M. and 103.0°F. P.M. A blood culture made on August 9th by Lieut. Carroll was found positive for *B. typhosus*. Rose spots appeared on the abdomen and back at about the same time. The temperature continued to fluctuate between 100.0°F. in the morning and 103.0°F. at night until August 15th when it began a gradual reduction first reaching 98.4°F. on August 21st. It remained between 98.0°F. and 99.0°F. until the evening of August 29th, when after a troublesome nosebleed, the temperature rose suddenly again to 103.0°F. This ushered in a typical relapse with temperature ranging between 103.0°F. and 104.0°F. until September 2nd, when it began to drop reaching normal about September 3rd. During the relapse patient was delirious part of the time and was extremely nervous. Diagnosis—Typhoid fever—severe.

"(4) Sergeant Joseph I. Howe—Became ill early in August but refused to go on sick

report. He was the Company Clerk, and his duties were light and he was excused from drills and rigorous discipline and allowed to ride in the ambulance when the Company was on the march. He took his own temperature, which he reported to be above normal. This man had 'walking typhoid.'

"(5) Private William E. Lumley—There is no sick record for him on file, and he obviously was not infected.

"(6) Private George Dunn, Register No. 4765—Taken ill on July 18th and transferred from the Regimental Dispensary at Gettysburg, Pa., to Fort McHenry, Md., July 25, 1904. Diagnosis—Fever, undetermined. He remained ill until September 20, 1904 when the diagnosis was changed to typhoid fever. The Widal reaction was positive July 29, 1904.

"(7) Private George C. Williams, Register No. 11052—Previous history negative. Was in good health until July 22nd, when he began having headache, pains in the bowels, general malaise and slight temperature. When admitted to hospital July 25, 1904 he complained of headache and had a coated tongue, fetid breath, abdominal tenderness and constipation. He ran a slight temperature from this date until July 30th, ranging from 98.0°F. to 101.4°F. No laboratory examinations. Discharged from hospital, August 1, 1904, with a diagnosis of fever, simple, cause unknown. There is nothing in this case to identify it as typhoid, except the source of infection which was the same in all of these cases.

"(8) Private George S. Ward, Register No. 11054—Previous history negative. Admitted to hospital, July 28, 1904. On admission he stated that he had felt well up to a week before, since which time he felt weak, sleepy and feverish, but had no abdominal pains or tenderness. After admission he complained of headache, and had fever which ran a typical typhoid course from July 28th to August 13. For the first week the temperature range was from 101.0°F. to 104.8°F. From August 14 to 28 the temperature range was normal. On August 29th there was another elevation of temperature, continuing from that date until September 7th. The clinical record shows that this patient went through a severe type of typhoid fever with a relapse. No records of laboratory examinations. Patient was discharged on October 23, 1904. Diagnosis—Typhoid fever.

"(9) Private Robert A. Eisemann, Register No. 11070—Was admitted to hospital



July 22, 1904, with a diagnosis of diarrhoea, but he had no fever, and went to duty July 25, 1904. He was readmitted August 14, when he was dull and apathetic, tongue was heavily coated, and he had headache and pains in the back and joints and abdominal pains. The bowels were slightly loose. This man had a typical severe attack of typhoid fever, with high temperature range for about two weeks thereafter. On August 26th, the typhoid was complicated by acute phlebitis of the right femoral vein. He was finally discharged on January 3, 1905, with the evidence of the residuals of phlebitis. No records of laboratory examinations. Diagnosis—Typhoid fever severe, with complicating phlebitis, acute, right femoral vein.

"(10) Private Merl Clifford, Register No. 11053—Previous history negative. Felt well until the evening of July 22, at which time he felt lazy and indolent. When admitted to the hospital on July 25, 1904, the tongue was slightly coated, and there was headache and elevation of temperature which continued until August 4th. The clinical history indicates that he had a very mild attack of typhoid, the temperature fluctuating between 99.0°F. and 103.8°F. No record of blood cultures, but the Widal reaction was performed August 2, 1904 and was reported as showing partial agglutination. The diagnosis in this case was Fever, simple, cause unknown, but it appears to have been typhoid. He was discharged from the hospital September 1, 1904.

"(11) Private William J. Epps—The only record in this case was admission August 24, 1904 from fracture of the ribs incurred while exercising on a horizontal bar. It may be assumed from this that this man never became infected.

"(12) Private Claud W. Powell, Register No. 11051—Previous history negative. Health was excellent up to July 23, 1904, when he began having headache. He had a chill on July 24th and his bones ached with general malaise; fetid breath and looseness of the bowels. He was admitted to the hospital July 25, 1904 when the temperature range was between 98.0°F. and 99.0°F. He was discharged July 31st with a diagnosis of Febricula, simple. There was no record of laboratory tests. A corrected card was submitted, Register No. 11059, which gave the diagnosis of typhoid fever. There is nothing in this record to indicate that the disease was typhoid, and the diagnosis was apparently changed because he was known to have taken the vaccine. Although this illness was prob-

ably so caused, it cannot be accepted as a bona fide case of typhoid.

"(13) Private Robert E. Bowman—Previous history negative except that he had an acute epididymitis and orchitis for several days before admission. Was admitted to the hospital on August 9, 1904, and had what appears to be a severe attack of typhoid fever. Between August 10th and August 19th the temperature range was between 98.0°F. and 103.0°F. Between August 10th and August 23rd, the range was below 100.0°F. From August 23rd until the 10th of September, there was considerable elevation of temperature, ranging from 99.0°F. to 104.8°F. The disease was complicated by severe tonsillitis, follicular, beginning August 29th. No laboratory examinations on record. The case is complicated owing to the pre-existing epididymitis and the tonsillitis. Patient was discharged as cured November 30, 1904. Diagnosis on chart, Typhoid fever; tonsillitis, follicular, acute, August 29, 1904. This man probably suffered a relapse about August 20, 1904 since at the time the fever recurred, rose spots were noted.

"Omitting Lieutenant Carrol, who was definitely known to have had typhoid fever, out of twelve men who took the typhoid vaccine, seven suffered from undoubted attacks of typhoid fever, and three more suffered from a febrile disease, which may or may not have been atypical typhoid fever.

"It is unfortunate that so few laboratory investigations were made on these cases. The reason undoubtedly was that since they were known to have taken the typhoid vaccine, the diagnosis was unquestioned in the minds of the hospital authorities. Also, at the time, it was desired to give no undue publicity to these cases. However, blood culture was known to be positive in at least one case (Vedder) and the Widal was positive in two other cases (Clifford and Dunn).

"After the illness of these men, the vaccine used was plated, and was found to have two or three organisms per cubic centimeter. Since 30 c.c. were given, each man must have received from 60 to 90 living organisms at each dose. This sets the infective dose at this small number of organisms. It is also to be noted that the organism was isolated in 1898 and had therefore been continuously in culture for six years. This therefore, definitely fulfills Koch's postulates for typhoid. It also shows that the virulence of the organism was not lost in six years of cultivation.

"The incubation period is fixed in four cases, since the first dose was taken on July



12, 1904, and the onsets were—Dunn, July 18; Eisemann, July 22; Clifford, July 22; Ward, July 28. The incubation period in these cases, therefore, was six days once; ten days twice; sixteen days once. The incubation period in the cases of Gilchrist and Vedder is not fixed definitely since both took more than one dose.

"The only individual with a definite history of typhoid (Carroll) remained entirely well, indicating the high degree of immunity conferred by the disease. It is possible that the men who remained well may have had unrecognized typhoid earlier in life.

"The technical failure of this vaccine depended upon a very simple error. The flask containing the vaccine, plugged with cotton was placed in a dry air sterilizer set at the thermal death point for *B. typhosus*. Though left there for one hour, it is evident that all organisms were not killed. The flask should have been placed in a water bath in order that the temperature could penetrate the contents of the flask more rapidly. It is true that cultures of one cubic centimeter lots of the vaccine made after this exposure were sterile, but if there were but a few living organisms in the liter flask, possibly several one cubic centimeter amounts might be withdrawn without containing living organisms. Cultures for sterility should obviously have been made just prior to use.

"This was a first attempt in a new technique, and it is not surprising that errors occurred. This ended the attempt at oral administration of typhoid vaccine, and typhoid vaccine was not used in the United States Army until 1911 when parenteral vaccine was introduced by Major F. F. Russell."

It is known that all steps in the preparation of this "vaccine" were repeated by Carroll and Vedder and that again small numbers of viable organisms were recovered. Under the conditions described the temperature at the center of the flask containing the typhoid culture probably never exceeded 52°C. and possibly reached 50°C. for a period of 20 minutes. After this the "vaccine" was incubated for a week at 36°C. and then tested for sterility without finding organisms at the initial tests. It could be argued that the failure to find viable organisms at this time, and only organisms in very small numbers subsequently, could be due to the simple test media used in 1904 and that perhaps enrichment media would have shown

that a much greater number of organisms was actually present. However, this organism had been on artificial media for several years and was readily recovered when larger test inocula were employed. The findings all are compatible with Vedder's belief that relatively few viable organisms were responsible for initiating the disease. It may also be noted that the incubation periods varied from 6 to at least 16 days and that the infecting dose did not override Carroll's immunity.

The program was initiated during the summer when the maximum number of typhoid cases could have been expected. The water supply of Washington Barracks was under question, as was the water supply of practically every other post in the Army, and boiled water was issued for drinking purposes. Washington Barracks Post and General Hospital had a total of 11 cases recorded as typhoid (actually typhoid and paratyphoid) for the year 1904.<sup>146</sup> It would appear that either 6 or 7 of these cases were from the group of 13 volunteers. In other words 13 men presumably at risk, one known to have previously had typhoid fever, contributed more than half of the total cases of typhoid for the year at this post. Finally it may be noted that the officers and the enlisted men, for at least part of the time, probably did not share the same food. Despite the relatively high incidence of the naturally occurring disease this ratio of illness seems unlikely to have resulted from chance.

It is truly unfortunate that the results of this study were not published promptly. On epidemiological grounds the evidence as to the small number of typhoid organisms required to produce disease, i.e., in the order of a hundred viable cells would have been convincing, and certainly would have emphasized the need for stringent public health measures to control the spread of the infection. The results were known to the military medical officers of that time and one may assume that they served to speed the development of military hygiene, whose principles received widespread acceptance be-

tween 1905 and 1910. Ashburn has appraised this period by noting that "the line officer of 1911 knew more about the prevention of typhoid fever than did the physician of 1898."<sup>17</sup>

It is interesting to note that, at almost the same time Wright in England in a small study investigated the possibility of oral administration of typhoid vaccine in seven men without conclusive results. The only reference to this study is in a monograph published in 1904<sup>18</sup> and which was not available to Carroll since it contains a reference dated May 7, 1904. Wright<sup>18</sup> also seems to have been the only other investigator previously to have administered viable typhoid organisms to a subject. This was given subcutaneously and there were no ill effects.

The efficacy of oral typhoid vaccine is still debated. This was the first time that an immunological response in guinea pigs to orally administered typhoid organisms had been observed. After this study it was to be fifteen years before Besredka<sup>19</sup> seriously investigated the oral route of immunization against typhoid fever in man.

Colonel Vedder does not spare the investigators for the error made. If, in retrospect, one is inclined to be critical, perusal of the medical literature, and lately the newspapers, will show that there have been one or more similar episodes in the development of practically every vaccine. Rather than be critical, one should take note of the small carefully planned field trial, using the experimenters and a few volunteers. There is a statement in the last paper of Reed and Carroll<sup>8</sup> which seems to epitomize the spirit of such studies. . . .

"Of course it will be thoroughly appreciated that in experimentation on human beings, aside from the grave sense of responsibility, at times well-nigh insupportable, which the conscientious observer must always feel, even with the full consent of the subjects to be experimented upon, there must be added another factor, viz., the difficulty of finding willing and suitable non-immune individuals for experimentation just at the proper and urgent moment."

A serious problem existed, an investigator had an idea, and there were men with courage to submit it to the test. Despite the failure, due to an error in technique, the following facts relative to typhoid fever are of intrinsic and permanent scientific value:

1. The organisms (Dorsett strain of typhoid bacilli) had been on artificial culture media for six years.

2. The infecting dose for man was small and produced typical disease in at least 7 of 12 presumed susceptibles.

3. The simultaneous ingestion of a large number of killed organisms along with the few viable cells had no appreciable salutary influence on the disease picture.

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#### WILLIAM L. KELLER MEMORIAL LECTURE

The Seventh Annual William L. Keller Memorial Lecture will be held at 8:00 P.M., May 21, 1959, at the Sternberg Auditorium, Walter Reed Army Medical Center, Washington, D.C.

"Lesions of the Parathyroid, Adrenals and Thymus Amenable to Surgery," will be the subject of the lecture which will be given by Doctor Frank Glenn of the New York Hospital-Cornell Medical Center.

Everyone is invited. This lecture will conclude the current series of The Surgeon General's Medical Meetings at the Sternberg Auditorium until next Fall.

# The Relationship between the Concentrations of Serum Lipoproteins and Serum Lipids\*

By

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(With six illustrations)

GOFMAN, in 1950, reported<sup>1</sup> that the serum lipoprotein concentrations determined by ultracentrifugation were significantly correlated with the incidence of coronary disease in the American male. Subsequently, the utility of such measurements as diagnostic and predictive measures of coronary disease has been the subject of extensive evaluation.<sup>2-7</sup> Age specific values for the concentrations of the standard lipoprotein classes have been recorded.<sup>8</sup>

This report will compare the measurement errors involved in the estimation of serum concentrations of lipids and lipoproteins; the extent of correlation between ultracentrifugally determined serum lipoproteins and the corresponding concentrations of cholesterol and lipid phosphorus; and, age specific values for such serum parameters in the same population.

## EXPERIMENTAL

In order to study measurement errors and the correlative relationships between parameters, sera from 20 normal (N) subjects and 20 persons with a proven history of myocardial infarction (MI) were used. All the tests on these samples were performed in duplicate.

The age specific data were obtained from a population of 1,423 obtained from various service agencies†† during the period 1953-

1957, during which time this facility was involved in evaluating the variously reported indices of coronary disease.

The sera were analyzed for the ultracentrifugal concentrations of the S<sub>1</sub><sup>0</sup> 0-12, S<sub>1</sub><sup>0</sup> 12-20, and S<sub>1</sub><sup>0</sup> 20-400 lipoproteins by methods described elsewhere.<sup>9-11</sup> In addition, the atherogenic index (A.I.) was calculated.‡ Serum cholesterol concentrations were measured by the Bloor method<sup>12</sup> and lipid phosphorus levels were determined by the Fiske-Subbarow technic.<sup>13</sup>

## RESULTS AND DISCUSSION

Measurement errors involved, as determined after duplicate analysis of lipid and lipoprotein variables, in the two groups of 20 N and 20 MI subjects are recorded in Table 1. The differences between the means of the MI and N groups for each variable are significant and confirm data previously reported.<sup>15</sup> The measurement errors¶ are roughly equivalent for the MI and N groups. For ultracentrifugally determined lipoproteins, this error ranges from 8.5 to 19.1 percent; lipid phosphorus is approximately 4 percent; and cholesterol 2 percent.

The correlations between A.I. and the other parameters are given in Table 2. The duplicate determinations of A.I. gave a correlation of 0.916, somewhat less than the

Point cadets, 199 Army basic trainees, 348 Pentagon officers, 228 Air Defense Command personnel, 105 officers referred to the School of Aviation Medicine Consultation Service, and 84 School of Aviation Medicine personnel.

¶ The measurement error in percent is defined as the within subject standard deviation divided by the mean of the first determination and multiplied by 100.

\* The material in this article represents the personal views of the authors and is not to be construed as official Air Force policy or to represent the views of the Department of Defense.

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†† The breakdown of the group shows 459 West

‡ A.I. = 
$$\frac{\text{concentration (S}_1^0 \text{ 0-12)} + 1.75 \text{ concentration (S}_1^0 \text{ 12-12} + \text{S}_1^0 \text{ 20-400)}}{14}$$

TABLE 1  
MEANS, STANDARD DEVIATIONS, AND MEASUREMENT ERRORS FOR SERUM  
PARAMETERS IN 20 MI'S AND 20 N'S

Variable	Mean		Standard Deviation		Measurement Error (%)	
	MI	N	MI	N	MI	N
S <sub>i</sub> 0-12	462	375	122	84	8.5	11.3
S <sub>i</sub> 12-20	63	45	35	22	19.1	9.6
S <sub>i</sub> 20-400	155	125	110	101	18.0	14.5
S <sub>i</sub> 0-400	680	545	207	165	9.8	10.2
A.I.	85	67	29	25	10.7	9.9
Cholesterol	326.4	270.3	73.7	44.6	1.9	2.0
Phospholipid	11.65	10.30	2.45	1.25	3.8	3.8

largest obtainable value of 1.00. All other correlations reported are less than 0.916.

Since the correlations between A.I. and other serum parameters are high, and also since the measurement errors of some of these variables are as small as or smaller than those for A.I., it seemed appropriate to ascertain whether A.I. might be satisfactorily predicted from a linear combination of some or all of these other variables. The data on the 1,423 subjects were used to formulate equations which predicted A.I. from combinations of the three parameters, age, cholesterol, and lipid phosphorus. The best such equation made use of all three parameters and took the form:

$$\text{A.I. (predicted)} = -26.48 + .1661 \text{ age} + .1947 \text{ cholesterol} + 2.4906 \text{ lipid phosphorus.}$$

This equation was used to estimate A.I. from the first run determinations of cholesterol and lipid phosphorus for the N and MI

groups totaling 39 samples. These predicted A.I. values were correlated with both A.I. and A.I.<sup>1</sup>; the correlation coefficients were .800 and .816 respectively. It is evident that there is better agreement between the duplicate measurements of A.I. than between A.I. and the A.I. predicted from the given equation.

The age specific values for S<sub>i</sub> 0-12, S<sub>i</sub> 12-20, S<sub>i</sub> 20-400, A.I., cholesterol, and lipid phosphorus are presented in Figures 1 through 6. The black X's indicate two stand-

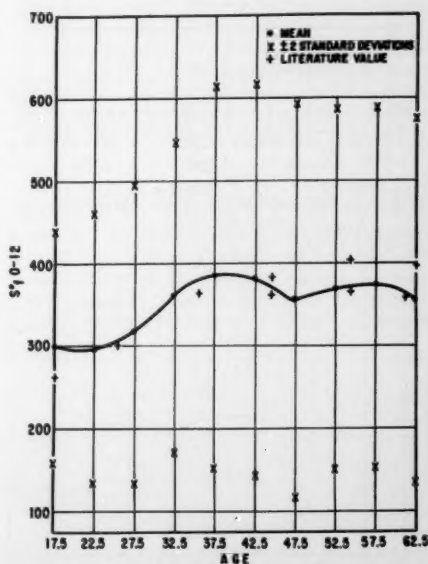


FIG. 1. Age trend of S<sub>i</sub> 0-12 lipoprotein concentrations.

TABLE 2  
CORRELATION COEFFICIENTS (R) BETWEEN  
A.I. AND SERUM PARAMETERS

Variable (Y)	r <sub>A.I.Y</sub>
0-12	.669
12-20	.656
20-400	.894
a.I.	.916
Cholesterol	.779
Phospholipid	.801

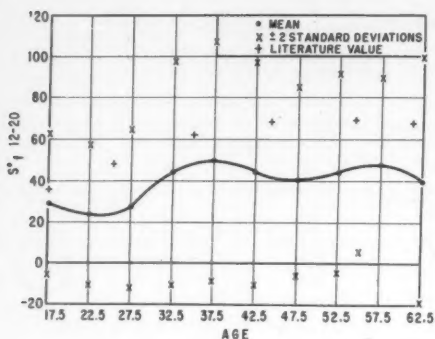


FIG. 2. Age trend of  $S_f$  12-20 lipoprotein concentrations.

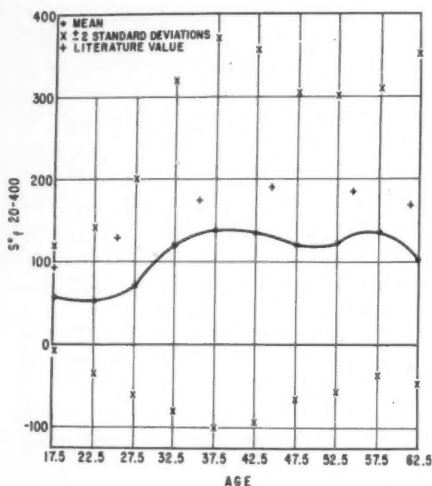


FIG. 3. Age trend of  $S_f$  20-400 lipoprotein concentrations.

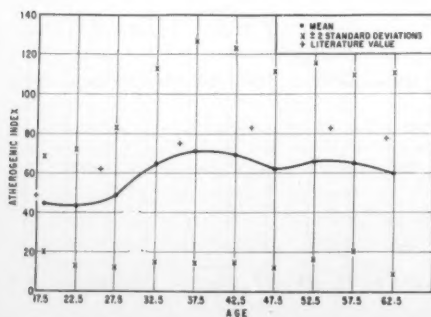


FIG. 4. Age trend of atherogenic index values.

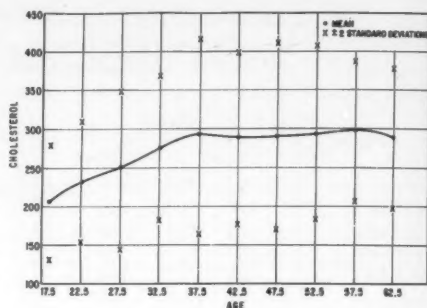


FIG. 5. Age trend of cholesterol concentrations.

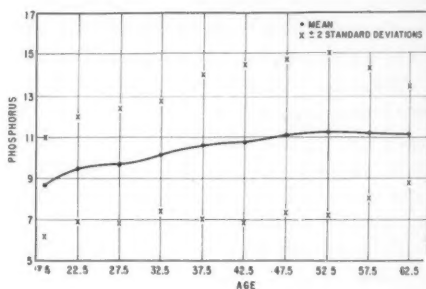


FIG. 6. Age trend of lipid phosphorus values.

ard deviations from the mean. The + 's are points from reported literature data.<sup>8</sup> Table 3 gives the age breakdown of the 1,423 persons included in the study.

If the assumption is made that these cross-sectional data are indicative of age changes in the individual, such then predict that all

TABLE 3  
AGE DISTRIBUTION OF 1423 SUBJECTS

Age Group	Number
17-19	70
20-24	509
25-29	145
30-34	35
35-39	117
40-44	186
45-49	195
50-54	111
55-59	37
60-64	18
	1423



the lipoprotein concentrations and the cholesterol level will increase at comparable rates during the third and fourth decades of life, after which levels will be maintained. Serum lipid phosphorus concentrations increase at a less rapid rate in an almost linear fashion, but the increase is maintained until the individual is past 50 years of age. Decreased levels in the oldest age group may, of course, represent the process of natural selection.

In general, the Gofman lipoprotein data for a civilian population are significantly higher than the data reported here for the military group. This observation has been noted in previous publications<sup>16-18</sup> on small samples, and may also be attributed to the selection which attends induction into the service.

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# The Sanitarian in Disaster Situations

By

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**I**N EVENT of a major disaster, the sanitarian, whether he be military, civilian, or industrial, will be vital to survival of masses of humanity consisting of displaced and homeless persons from all levels of society and in all states of mental health. A complete disruption of utility and municipal services, including a complete breakdown of sanitation services may be anticipated, with consequent instantaneous reversion of society to actual conditions of primitive survival of the individual, further complicated by radiological, biological, or chemical hazards.

Under such conditions of crude survival, care of the injured will be the prime consideration. Competing for urgency of action will be that of sanitation, not the luxury sanitation of a modern community, but the crude sanitation of survival, the urgent sanitation needed to prevent conditions favorable to the propagation and spread of disease. In addition to physical fitness and stamina, this will require a knowledge of basic sanitation facilities, devices, and techniques; extensive supervision of layout, construction, and maintenance; and perimeter sanitation to control the disease potential of insects, rodents, and stray animals. For these considerations, who else but the sanitarian is capable of assuming leadership? Who else but the sanitarian is available, motivated, and qualified by virtue of training and experience? The sanitarian should therefore organize his thinking along these lines and formulate his plans with such eventualities in mind.

To assist in such formulation, the following considerations are outlined to aid in the

The opinions or assertions contained herein are the private ones of the author and are not to be construed as reflecting the views of the Navy Department or the naval service at large.

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full comprehension of the disaster situation. Basically, there are two kinds of disasters: (1) Natural, caused by cyclones, hurricanes, typhoons, floods, earthquakes, or tidal waves; and (2) Man-made, caused by accidents or warfare, whether conventional, radiological, biological, or chemical. All disasters, whether man-made or natural, will be accompanied by one or a combination of the following effects: (1) Blast or pressure, (2) Heat, (3) Contamination, (4) Flooding, or (5) Violation of law and order. A combination RBC (radiological, biological, chemical) attack could conceivably result in any or all of these in their most severe state. Consequently, such an attack at any time or place is probably the best basis for disaster planning. Activation of any phase of the plan then, would merely depend upon the extent to which the organization may be needed.

Organization for disaster includes the provisions of civil defense in the civilian community and of passive defense in the military. Civil defense is defined as the protection of the home front by civilians acting under civil authorities to minimize casualties and war damage and preserve maximum civilian support of the war effort. With the advent of hostilities, the drain upon our country's resources will necessarily be great. Plans for civil defense must be made with full recognition of the importance of maximum economy in the use of available supply of men, money, and materials. Passive defense, to the military, means any and all measures of a non-aggressive nature taken by a military activity to reduce the probability and minimize the effect of damage in peace or war whether due to natural or man-made causes.

In wartime, the primary mission of the armed services is to prosecute the war against the enemy and to bring the hostilities to a successful conclusion as soon as possible. Al-

though originally assigned to the military between 1945 and 1949, responsibility for civil defense planning was assigned to the National Security Resources Board in March 1949. Under the revised program, the military assumes certain general responsibilities in the active defense phase of the civil defense program. Those responsibilities are outlined as follows:<sup>1</sup>

- a. Guidance to the Federal civil defense agency as to which areas are most likely to be attacked.
- b. Furnishing as much information as possible to the Federal civil defense agency as to anticipated forms of attack, plus technical advice as to defenses against such attack.
- c. Decisions as to effective passive defense measures required as a military necessity and technical requirements for carrying them out (e.g. blackout, camouflage, etc.).
- d. Warning of impending attack.
- e. Assistance where possible in the event of war-caused disaster, and upon request by proper authority.
- f. Disposal of unexploded ordnance.
- g. Technical assistance in training programs for key civil defense personnel.

Section (e) contains the "joker in the deck" as far as military sanitarians are concerned, because under such provision, "request by proper authority" is anticipated.

The military has three principal interests in civil defense: academic, humanitarian, and professional. The academic stems from long association in the planning of techniques for civil defense, and for the general civil defense plan. The humanitarian stems from the traditional services of military forces rendering assistance to civil powers in time of disaster. The professional interest stems from limited ability to perform all-out disaster relief in times of war because of its primary mission to fight the war and successfully terminate it at the earliest possible moment.<sup>2</sup>

In the above situation, the primary responsibility of the military sanitarian is to his command to enable the military organization to perform its mission and to minimize personnel and material casualties. Under such responsibility, he may be as-

signed to other Department of Defense activities under a program of mutual aid, or he may be assigned to civil authorities in the civil defense organization. Regardless of the immediate assignment, the basic functions will be fundamentally the same. Consequently, the subject will be treated along these lines for purposes of this paper.

At this point, the assumption is made that some sort of a disaster plan exists; for the plan to be effective, a critical analysis is necessary. Each course of action must be reviewed initially and frequently for the following aspects: (1) Suitability: will it accomplish its purpose in a minimum of time? (2) Feasibility: can it be accomplished with the personnel and material available? (3) Acceptability: is it worth the cost from the standpoint of personnel and material casualties? Each course of action planned should be designed to be self-sustaining, at least during the initial phases, and especially during widespread attack by hostile forces. In line with these three factors is a comment or two on the general tenor of disaster plans as conceived by many organizations. Elaborate plans have been drawn up with extensive lists of materials deemed essential and provisions for stockpiling these items at some future date in some accessible location. Assuming these plans are well-conceived and a select list of materials is stockpiled, what is going to happen when the massive destruction of the special weapons completely eliminates these stockpiles? If the stockpiles survive, what is going to happen when they run out? The authorities admit that the best they can hope for is to have the stockpiles for some of the larger cities last for six to eighteen hours at most. What happens then? Then will begin the really critical period of survival. It is then that we will have to answer the question: What are we going to do for ourselves? instead of the question: What is the government going to do for us? It is at this time that we as sanitarians must furnish the answers to basic survival problems and techniques resulting from the use of special weapons. We must be prepared to teach and guide others in the elements of survival sani-

tation. Perhaps that may even be our greatest role.

The main problem to be faced from the use of special weapons is one of sheer volume, one of providing personnel, supplies, and facilities to treat simultaneously the great numbers of living casualties and survivors resulting from each attack. It must also be remembered that although mass treatment of casualties constitutes the largest single civil defense problem, there are other extremely important health services which must be supplied. These include detection and recognition of radiological, chemical and biological hazards; various measures to prevent the spread of disease; and maintenance of adequate sanitation.<sup>3</sup> A general idea of the background material has been presented. Since our primary concern as sanitarians will be with maintenance of adequate sanitation, some of the specific problems to be expected will be discussed.

#### WATER SUPPLY

One of the most critically important problems is that of insuring a safe water supply for the survivors and the rescue forces. In a natural disaster, water can be made safe by boiling or by minimum chlorination to 5 p.p.m. This amount of chlorine is palatable and safe. In fact it was used routinely as the minimum for our troops during the Korean War even from a protected water source. In case of contamination by war gases, such as mustard, lewisite, or the nitrogen mustards, the addition of activated carbon to the extent of 30 to 90 p.p.m. for each p.p.m. of gas will effectively adsorb the dissolved gases within a half hour. Alum can then be added at the rate of about 175 p.p.m. followed by sufficient soda ash to give optimum coagulation, followed by sedimentation and filtration. If nerve gas is present in the water, the supplies should be first treated with 5 to 10 p.p.m. of soda ash and allowed to stand until the nerve gas concentration is near zero, usually within an hour. Clarification with alum is followed by sedimentation and filtration. The use of activated carbon probably will not be necessary unless other gases are also pres-

ent. Before use, the water should meet the following requirements: mustard, less than 2 p.p.m.; lewisite, less than 20 p.p.m.; nerve gas, less than 0.5 p.p.m.;  $P_n$ , greater than 5; chlorine demand less than 5. There should be no chemical odor or taste. If water requires chlorination, this should be done after the chemical treatment.<sup>4</sup>

The above is predicated upon the supposition that the public water supply is reasonably intact. Suppose the more likely probability that the public water supply is destroyed, or is heavily contaminated with radioactive fall-out, how will the minimum amount of water be supplied? (The minimum amount of water required is calculated as: 4 gallons per person per day—one gallon for drinking and cooking, one gallon for personal cleanliness, two gallons for laundry and dishwashing.<sup>5</sup>) The average person will probably do well to get one gallon per day for the first few days at least. But even this could create a problem, since all water used will have to be hauled in, probably from a long distance outside the fall-out zone, or it will have to be obtained from private supplies serving commercial, industrial, or farming sites. These sites should be located in advance and given a priority of use on the basis of accessibility by tank truck, adequacy, and sanitation determined by survey.

In some cases, the portable water purification units, as used in the Armed Forces may be available to supply potable water with first priority of use going to the rescue teams. Therefore, any opportunity to become conversant with the operation of these portable units should be utilized by sanitarians, because they more than likely will end up with the responsibility of operation if the military teams trained in their use are not available. The portable units may well turn out to be one of the most valuable assets for the safeguard of the rescue teams, because of their ability to decontaminate radioactive water. The normal treatment processes of coagulation, sedimentation, and filtration will remove considerable amounts of the radioactivity; the radioactive wastes then need careful disposal. Distillation, when feasible, will

also remove considerable amounts of radioactivity from water. Chlorination or other disinfection does not remove radioactivity but may be used to insure bacteriological safety after decontamination.<sup>5</sup> Water analyses will be a primary sanitation laboratory service needed following a severe disaster; so there should be no delay in undertaking such analyses.

#### FEEDING PROBLEM

The problem of mass feeding units will be the next major concern of the sanitarian. The mass feeding units may be assembled on site or may be in the form of mobile units of the civil defense group having this responsibility. Whenever it is possible, single-service disposable eating and drinking utensils should be used, especially until such time as proper washing and sanitizing facilities are provided. For this purpose, the four-compartment dishwashing arrangement is recommended as being most advantageous, since it will handle more utensils in the most expeditious manner.<sup>6</sup> Qualified culinary personnel may be recruited to augment the teams, but extra careful precautions in the preparation and serving of foods must be observed. A relaxation in sanitation procedures could cause widespread transmission of foodborne disease at a time when medical facilities would be seriously overloaded. Volunteer personnel not trained in the techniques of mass-feeding would need careful instruction and supervision.

#### REFUSE DISPOSAL

Refuse and garbage disposal from the mass-feeding units as well as the medical facilities would likewise require special precautions in handling and disposal. Compaction and covering by the sanitary landfill method would be the best procedure. This method is the most versatile and safe method as no fire or disease hazard would be created. Combustible materials could be burned, and incombustibles buried if a method of excavation and compaction were not available. This would reduce the amount of hand labor necessary to excavate a disposal site. Waste

water should also be disposed of in such a fashion that no nuisance or insect-feeding site is created.

#### FOOD STORAGE

In line with the mass-feeding situation, there are numerous particular problems concerned with food. The problems of salvage, decontamination, protection, and storage are so extensive that no effort will be made to treat this subject specifically in this paper other than refer the reader to the many excellent publications dealing with this matter listed in the bibliography. In general, however, it will be of interest to review a specific experiment conducted in 1953 and 1955 when representative drugs and foods were exposed to atomic explosion.<sup>4</sup> No chemical effects on heavily exposed drugs were found. It was found, though, that most of the containers in the boxes receiving the greatest amount of radiation were noticeably darkened and comparison showed that the amount of darkening was directly proportional to the amount of exposure. Such darkening is therefore an indication of exposure to intense ionizing radiation, information most useful following such an attack. Tests for sterility, pyrogens, and toxicity made on some of the drugs showed that normal commercial closures did not fail under the pressure changes and heat received. Antibiotics showed no adverse affects or appreciable loss of potency. Therefore, in case of major disaster when replenishment is doubtful, the risk involved in use of drugs given several days to "cool off," and having no more activity than the levels found under these conditions, could be permitted. The radiation dose received by the individuals would be less than could be tolerated under emergency conditions for short periods of time.

Fifteen tons of food samples comprising more than 100 foods selected to represent those used most frequently in the American diet were exposed to a 35 K.T. explosion. The exposed foods were stored under varying conditions equivalent to those found in daily storage. In the quarter-mile area, overpressures caused some crushing and distor-



tion, broke a few glass containers, and split some wooden panels. About 5 percent of the canned goods were lost and fruits and vegetables crushed and bruised. Farther away, tearing, bursting and/or perforation caused the greatest loss in the food stored under more normal conditions. As would be expected, wood, paper, plastic, and cellophane food packages often suffered greater physical destruction than cans and glass. Food stored in basements suffered much less damage than that above ground.

It is important to note that although the containers in many cases were radioactive, it did not necessarily mean that the contents were also radioactive. The radiation consisted of induced radiation in the sodium of the glass, the sodium and phosphorous in food, and somewhat less in the tin and zinc content of steel cans. In some instances, the radioactivity diminished rapidly and after several days could hardly be determined with a survey instrument, although the metal cans did not lose their activity as rapidly as did the glass. This indicates that in monitoring food after a nuclear explosion *decision as to suitability should not be based on readings made on the container alone*. Therefore, when testing foods for radioactivity, it is necessary to separate the contents and the container to determine the origin of the radioactivity. Seafoods and dairy products, both rich in phosphorus, were among the more important ones still radioactive after a month. Beverages, removed from bottles showing considerable radioactivity, could be safely consumed.

Based on the conclusions of the above test, it was concluded that foodstuffs one mile from an atom bomb or five to ten miles from a fusion weapon could be consumed immediately under emergency conditions, provided they were still physically intact. Food and drink close enough to receive induced radioactivity could be eaten after a few days of cooling off. The urgent need would counterbalance the danger, although they should not be consumed for any longer period than is absolutely necessary.

#### BIOLOGICAL WARFARE (BW)

Just as radiological warfare has its special problems for the sanitarian, so too has the use of biological agents. Biological warfare (BW) has been described as public health in reverse. It is the intentional use of living organisms or their toxic products to cause death, disability, or damage to man, his animals, or his plants. BW has never been waged on a large scale; so its dangers are estimated only from theoretical considerations. But just because it never has been used, doesn't mean that it never will be used, thus the possible use must be taken into consideration.

In order for micro-organisms or their products to be effective agents, they must meet certain criteria, with other properties desirable to increase their value depending upon conditions of use. The following characteristics are considered to be essential:

- a. The agent selected should be incapacitating or destructive.
- b. It should be economically produced in adequate quantities from available materials.
- c. It should maintain its virulence or infectivity during production, storage, and transportation.
- d. It should be easily and efficiently disseminated.
- e. There should be some form of protection available to the user.
- f. It should be an agent for which there is no widespread natural or acquired immunity.

Some of the particularly desirable features are: difficulty of detection, predictable persistence, multiple channels of infection, and natural portals of infection. For example, less than ten pounds of partially purified *Botulinum* toxin in 1,000,000 gallons of water would produce botulism in more than 90 percent of the exposed population.<sup>9</sup> Dr. Leroy D. Fothergill, Scientific Advisor to the Chemical Corps, adds additional emphasis to the strength of this toxin when he states, "Some agents have been shown to be much more toxic or infectious to experimental animals exposed to aerosols of optimum particle



size than by the natural portal. Botulinum toxin, for example, is several thousand-fold more toxic by the respiratory route than when given by mouth."<sup>10</sup>

Since BW is public health in reverse, it is logical to assume that good hygiene and sanitation are the cheapest protection against BW. They pay worthwhile dividends even if a BW attack never comes, and should be observed at all times, because it would be somewhat incongruous to protect personnel from BW and subject them to other food-borne diseases. The U. S. Navy Bureau of Supplies and Accounts indicates the following methods by which foods may become contaminated:<sup>7</sup>

- a. Overt or covert aerosol attack.
- b. Contamination introduced while food is being processed in the factory, during transit, or in custody of the user.
- c. Secondary aerosols from packages, food service spaces, equipment and utensils, or from clothing of food service personnel.
- d. Infected food service personnel.

The measures outlined for protection of foods are claimed to be effective against all probable BW agents, but not against all known micro-organisms and toxins. Certain micro-organisms are extremely difficult to destroy, but for utility reasons are not likely agents.

#### DISPOSAL OF DEAD

Another problem of major importance in which the sanitarian will become concerned is disposal of the dead. Plans should be fully developed that will permit ready collection, identification, and disposal of the dead. In case of high mortality, it will probably be necessary to omit most of the amenities or courtesies associated with the care of the dead. It is vital that the dead be disposed of promptly to prevent the generation of dangerous health conditions that will threaten survival of the living. This service is properly within the province of the mortuary services, one of the health services components, but the health department has the public health responsibility for the disposal

of the bodies and recording of the deaths.<sup>9</sup> It may be necessary to exert the utmost firmness in the handling of this delicate problem. Since family members, friends, or other persons to identify the victim will also be victims, it is more likely that burial without identification other than a tag will be necessary.

#### EXCRETA DISPOSAL

Excreta disposal may be expected to be a major problem, since existing sewage facilities will probably be inoperative. Many plans call for elaborate "Chic Sales" with real fancy designs. These are to be recommended for construction as soon as time and facilities permit, but they will hardly spring up overnight. For that reason, we will have to place the utmost emphasis on controlled excreta disposal immediately. Indiscriminate defecation must be prevented at all costs and the best way to handle the problem is by establishing trenches for each sex, properly protected by wind screens. Each person should cover his excrement to prevent fly breeding. Signs should be posted to that effect. Trenches are abandoned, mounded with earth, and placarded when filled to within 12 inches of the ground surface. Such measures will be adequate until the more elaborate fly-tight latrines can be provided. If not already trained, Sanitation Aides should be recruited from the refugees and instructed in the proper maintenance of excreta disposal facilities. Emergency latrines should never be placed over utility manholes because of the insect breeding potential and because of the difficulty in clean-up that ultimately becomes necessary. Bored-hole latrines offer one of the best possible solutions to excreta disposal, but this method depends upon the availability of equipment to dig or bore the hole necessary.

#### INSECT AND RODENT CONTROL

An element in disaster sanitation that is easy to overlook and is generally slighted in civil defense plans is that concerned with insect and rodent control, and control of

stray animals. Each of these could well be an extremely important factor in the spread of epidemic diseases. Due to the complete breakdown of sanitation and utility services, propagation of insects and rodents is likely to be quite rapid. Should the disaster occur in the warmer months, fly breeding may be expected to be extensive unless every effort is exerted during the initial phases of recovery to curtail this problem. The bodies of dead animals and humans, as well as other decaying organic matter will provide plentiful breeding sites. It is this facet that will create the explosive disease potential. During the Missouri and Kansas City floods in 1951, the breeding of flies proceeded at a fantastic and unbelievable rate from the bodies of dead animals and decaying organic matter. Quick action on the part of authorities averted an outbreak of disease, but photographs were taken showing the sides of buildings literally black with the resting flies before control measures could be effected. This might well be the situation following a disaster in which hundreds and thousands of people were killed, with many of the bodies accessible for fly breeding, but inaccessible for burial or cremation. It may be anticipated that flies and insects will begin to be a problem after about the first week, increasing in intensity and importance. There seems to be some difference of opinion on the urgency, but practical experience indicates early attention to preventive action, because insecticides and dispersal devices may not be available to provide control when most needed.

#### RODENTS

Rodents are not expected to be a problem for about three to four weeks, possibly longer, because in most cases there will be adequate food of one kind or another. Those in ground zero area doubtless will be eliminated, and it will take time or others to migrate into the area. Sooner or later, without control, a serious health hazard will exist and only concentrated action will prevent rodent-borne diseases, whether rodents serve as the vector or the vehicle.

#### STRAY ANIMALS

The third aspect of this particular problem concerns stray animals. Initially, these may be expected to be domestic dogs who have been deserted by the owners or the owners may have been killed, leaving the animals to scavenge for themselves. As the animals become hungry and grow wilder there is the problem of dog bites, rabies control, scavenging on garbage, dead bodies, and other animals. This, then, is no time to be concerned with devotion to man's truest friend. In this case, it will be survival of the fittest and the strays will have to go. Therefore, provisions must be made for destruction and disposal of all strays and possibly even those whose owners are present, since food and water will be at a premium.

#### VECTORS

Not an insignificant consideration in the problem of insect control is the possibility that disease-bearing vectors may have been released over or in the area concerned. This possibility has been recognized in the Navy's passive defense plan by the inclusion of a Vector Survey Team.<sup>8</sup> It is their function, as part of the medical element, to conduct a running survey and evaluation of control requirements, with recommendations for control techniques submitted to the Pest Control Team (an engineering element). Unfortunately, this fine division of responsibility does not exist in the civil defense structure. One reason is the lack of available trained personnel, another reason may be the failure to recognize the possible impact on the surviving population. It will therefore be up to the sanitarian to make this aspect a prominent consideration in his planning.

#### AIR CONTAMINATION

One of the eventualities to be considered by the sanitarian is that of air contamination, since the atmosphere, both inside and outside of buildings, is a potential vehicle for radiological, biological, and chemical warfare agents. The sanitarian responsible for planning emergency sanitation activities should

be fully aware of the possibilities. The sanitation personnel should not be the primary source of the monitoring personnel, because there are not enough trained sanitarians, and those that are available will be urgently needed in other capacities. Therefore, suitable training of monitoring personnel should be initiated early in the training program.

In this area, it should be remembered that most structures are permeable and would not act as absolute barriers against gases, although it is probable that gas concentrations in tightly closed buildings would be considerably lower than outdoors. Contaminants can be spread rapidly throughout structures equipped with forced air ventilating systems. Air scrubbers, filters, electrostatic precipitators, and other mechanical devices remove substantial amounts of suspended dust, pollen, and other particulate matter. On the other hand, the removal of gases from inlet air is neither simple nor commonly practiced.

#### EMERGENCY SHELTER

The final major consideration of the sanitarian in the disaster situation is that concerned with emergency shelters. These should be classified according to type of use and capacity for people in accordance with the emergency minimum health standards for occupancy. This work is the responsibility of the emergency welfare service, but the health services, through the sanitarian, will be responsible for setting the standards and arranging for periodic inspection and sanitary policing.<sup>6</sup> In the light of probable disaster conditions, it is more likely that the standards, as least initially, will be completely disregarded in favor of the immediate policy of providing shelter of some kind for the refugee population. Who, at this time, is going to insist upon a total of 100 square feet of floor space per person for temporary quarters? The standard is more likely to be: There is always room for one more!

In conclusion, it is desired to point out that all the foregoing material has but one purpose. That purpose is to emphasize that

whether the sanitarian be military, in a health department, or an industrial consultant, his role in passive or civil defense is a role upon which the lives of countless numbers of his countrymen, neighbors, friends, and relatives may depend. If the time ever comes when disaster strikes, the sanitarian must be prepared to assume his responsibilities to his fellow men. He must formulate his plans now because disaster will not signal its approach with time to spare for an elaborate reception. *Disaster's greatest ally is apathy*: apathy in the planning, apathy in the population, and above all, apathy in the professional health workers. To win this fight against apathy and disaster, we must prepare now—and prepare well!

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## Rehabilitation Nursing in a Specialty Hospital (Tuberculosis)\*

By

ELIZABETH A. ULRICH, R.N.†

FOR many years we associated rehabilitation nursing primarily with the activities of nurses who worked in specialty hospitals and public health agencies. Today we recognize that every practicing nurse assists with rehabilitative processes in her daily work though she is often quite unaware that what she does could be defined as rehabilitation; she simply calls it the art of nursing.

Rehabilitation nursing is both old and new to the nurse in a specialty hospital. She has been doing this type of nursing for a very long time. No doubt it was the challenge of the rehabilitative process that first attracted her to the special field. The nurse in the specialty hospital is well aware that without her skilled bedside nursing care, without her efforts in teaching and guidance, and without her ability to identify and interpret patient needs that the chronically ill patient might not have arrived at the point where he could utilize the specialized services of the rehabilitation team. Yet the modern concept of rehabilitation may be quite new to the nurse in a specialty hospital. It may be new to her to be told that she stands in the very center of all activities aimed toward the patient's restoration to normal living and that she is in the unique position of coordinator of the rehabilitative process. It may be new, and good news, to her that all nursing is now helping her to define her role and functions in rehabilitation for it is a fact that she has desperately needed this help for a long time.

I have been asked to talk about the nurse's role in rehabilitation in a tuberculosis hospital. Probably no other patient highlights the rehabilitative aspects of nursing care as does the patient with tuberculosis. Tuberculosis nursing is rehabilitation nursing. In no other field have we defined more clearly what the nurse does to assist the patient in his plan for recovery. I am sure that everyone here knows something about tuberculosis nursing and some know a great deal about it. Therefore, I believe that this discussion can take a broad approach to the areas in hospital nursing care that vitally affect the rehabilitation of the patient with tuberculosis.

The modern tuberculosis hospital is both a treatment and a training center for patients with pulmonary tuberculosis and in this hospital the patient requires the services of many different types of professional workers. The nurse is one member of the hospital's professional team and she knows that through teamwork she can help meet the patient's psychological, spiritual, social, recreational and even vocational needs at the same time that she is meeting his physical nursing needs. This is particularly true in tuberculosis because the social and psychological implications are so tremendously important in this disease.

Today the patient with tuberculosis does not present the obvious crippling conditions that he once did. The primary challenge of rehabilitation in this field is in the serious unseen crippling effects of tuberculosis. Because of the nature of this disease, tuberculosis creates serious personal problems for the patient from the time of diagnosis, problems that often throw him emotionally off balance. He receives a series of blows in rapid succession; first, the shock of the diagnosis, then the interruption of his work, and finally separation from his family. He is ex-

\* Presented at the Nurses Section Meeting, 65th Annual Convention of the Association of Military Surgeons of the United States, Washington, D.C., November 18th, 1958.

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pected to adjust physically and mentally to treatment of the disease in that strange environment called the hospital; he must adjust to a changed social and economic status for himself and his family; then there is the problem for him of future employment in addition to the problem of continuous medical follow-up. These factors which run through the patient's entire experience with tuberculosis have a great deal of bearing on the success or failure of his treatment. The patient's reactions to the disease depend a great deal on how the people around him react in the first few days after he finds he has tuberculosis and how he is treated in the early days of his hospital care.

In planning for patient care in a tuberculosis hospital, the nurse considers those areas that significantly affect the patient's recovery and how she must function in these areas. First, there is the communicability of this disease; then there is the area of health education for the patient and his family and contacts; and finally, there is the important area of therapy for adequate medical and surgical treatment of the patient's physical illness must be provided. Successful nursing care of the patient depends on how skillfully the nurse can weave her many functions in all of these three areas into a service that will meet the patient's needs during his rehabilitation. For this she needs special training, knowledge of the basic scientific facts about tuberculosis and of the measures that control this disease. She needs to acquire a philosophy and certain attitudes about tuberculosis; that this is not a hopeless disease, that the patient gets better, goes home and can completely rehabilitate himself. With this type of philosophy, the nurse can teach the patient how to help himself to the cure and she can be one of the most valued members of the rehabilitation team; without such a philosophy, she contributes poorly.

The hospital nurse considers that her first rehabilitative function is to provide the patient with adequate treatment through skilled nursing care and she also trains other workers to meet the patient's needs for personal care. She knows that the patient with tuber-

culosis requires as much skilled medical and surgical nursing care as any other hospitalized patient if he is to make good progress toward recovery. Bedrest and diet are still basic treatment for tuberculosis and now the powerful adjuncts to treatment, chemotherapy and newer techniques in chest surgery, can shorten the patient's hospital stay to an average of eight to ten months.

The second important way in which the hospital nurse functions in rehabilitation of the patient with tuberculosis is in teaching. One cannot consider tuberculosis nursing without thinking of the nurse as a teacher. She must be a first-rate teacher with this patient for his education about tuberculosis in general and about his own case, and his cooperation in treatment and in safety measures to protect others are all an integral part of his therapy. Teaching with this patient must start at where his greatest need lies. For the newly hospitalized patient, the need is usually for a working knowledge of tuberculosis for he is acutely aware that because he has a communicable disease he is considered a public health hazard in the community. Therefore, the starting point for instruction and for patient cooperation must necessarily be in the area of communicability. Not only do we know this need of his but the patient knows it too and he will cooperate if we work with him. The two important factors around which the hospital nurse centers her teaching of protective measures are the hygienic habits of the patient and the vulnerability of a person's respiratory tract when in contact with this patient. Through her instruction of the patient and her supervision of his practices as well as through the patient's observations of the safety measures she uses, the nurse gives the patient valuable lessons in disease prevention and control which she hopes he will later apply in his home and in the community.

Another important way in which the hospital nurse functions in the rehabilitation of the patient with tuberculosis is as coordinator of the many hospital services which assist the patient with his recovery and give

him continuity of care until his medical rehabilitation is complete. She interprets the patient's needs to other members of the hospital team and to his family. At the same time she interprets hospital services to the patient and guides him in his plan for rehabilitation. In this area, the nurse becomes the doctor's most valued assistant since she is with the patient most of the time and is in a position to judge how he is adjusting to the diagnosis of tuberculosis and to his medical treatment. Because of her continuous contact with the patient, it is to the nurse that the patient most often reveals the existence of social and economic problems that are interfering with his ability to utilize therapy. The nurse then becomes a channel through which the patient can be put in contact with other members of the health team such as the social worker, the psychologist, or the vocational counselor as the need indicates.

In a specialty hospital, the rehabilitation process begins with the patient's admission and the nurse is one of the important persons who can help start it. Probably the best way for me to explain how she starts this process is by illustration; so follow along with me and in your mind's eye observe what happens to the tuberculosis patient as he arrives at the hospital door and is admitted for treatment. It is the nurse who admits the patient to the ward area and her most important function at the moment is as a hostess. She welcomes him, orients him to hospital living by explaining routines, answers questions that he and members of his family may have, introduces him to the other patients and to the hospital personnel, familiarizes him with the physical facilities, and he begins to feel that he is in a friendly, helping place. It is the nurse who secures a brief summary of the patient's medical and social history so that the hospital staff will immediately be aware of significant medical and social problems the patient may have without requiring him to have numerous interviews at the time of admission. She recognizes the importance of safeguarding the patient's sense of self-esteem and knows that the way she interprets

his illness to him and her relationship with him at this time may affect the whole course of his treatment. Therefore, the admission procedure itself becomes a significant initial step in the rehabilitative process.

At the time of admission, the nurse gives the patient only the minimum amount of instruction. All that he really needs to know the first day is the ways in which he should protect other people from infection and how to protect himself. The nurse gives the patient a demonstration in how to use tissues to cover his nose and mouth when coughing and sneezing, how to dispose of the used tissues, and how to care for his thermometer. Even these important instructions may at times be delayed, depending on the patient's physical condition and needs. During the patient's first week in the hospital, the nurse plans at least two teaching interviews in order to give him a working knowledge of tuberculosis. She fortifies her teaching efforts with specially selected printed materials, including a handbook prepared by the hospital staff which answers many questions the patient may have about his activities. In about two weeks, after many laboratory tests and examinations on this patient, the nurse attends a medical conference that is held to confirm or determine the patient's diagnosis, his possible prognosis, and the kind of medical treatment he should have. As the patient starts treatment, no one can be more influential in securing his intelligent cooperation than the well-informed nurse. Her helpful interpretation of matters on personal hygiene, diet and rest, her skilled care and her sympathetic understanding promote both physical and mental rest for the patient. All during this treatment period, the nurse attends the rehabilitation conferences at which the professional staff members discuss the patient's progress and his plans for the future and here she contributes a summary of nursing observations relating to the patient and his progress. It is the quality of relationship that the patient has with the hospital staff that can make the difference between an insecure patient who has difficulty in accepting treatment and a well-ad-

justed person who knows that recovery is possible for him. It is interesting to observe that in a hospital where there are satisfactory nurse-patient relationships and a well planned educational program, there is a noticeable spirit of cooperation in the air. You can feel the closeness of the relationship between the medical and nursing staff and the patients. You can see what is happening to the patient as he becomes actively involved in learning how to help himself back to health. As he understands the "why" of treatment, he can take his rest more easily and he practices safety measures more carefully.

Another interesting area for illustration of the hospital nurse's role in rehabilitation is in the final phase of the patient's treatment, usually the last two months of his hospital care. During this final two-month period, the nurse has many individual conferences with the patient to discuss his home conditions, arrangements for follow-up care and his adjustment to the community. In these interviews she also reviews with the patient methods of preventing infection in others, and the importance of regular follow-up for himself and for family members. She furnishes him with information about the public health clinic near his home where he and his family members may have regular medical follow-up. At the time of the patient's discharge from the hospital, the nurse completes a summary of the patient's status which is used by the hospital administrative staff to advise the patient's local health department that he has completed hospital care and inform that agency what community health services the patient may need.

Today nursing is particularly aware of the importance of this linking of the patient's hospital experience with the community health services that the patient will be seeking when he returns home. Lags in our referral system between hospital and home usually mean lost opportunities for continuity of the rehabilitative process. Most important, the patient suffers for he often does not know where or how to get the treatment and services he needs.

In this discussion of rehabilitation nursing in a specialty hospital, I have attempted to emphasize the following:

(1) Rehabilitation nursing is not new to the nurse in a specialty hospital.

(2) The nurse has three significant rehabilitation functions in a specialty hospital; she is a practitioner of nursing therapy, she is a health teacher, and she is an interpreter of both the patient's needs and the services that are available to him.

(3) During his treatment in a specialty hospital, the patient looks to the nurse not only for personal care but also for information, understanding, motivation and counsel.

In conclusion, as the patient's needs arise the nurse is closer to him than any other member of the professional staff. If she is well trained in her special field, she can accept and appreciate the patient as a total person. She can recognize that she is in a unique position to serve him rehabilitatively and she will use the technical skills of nursing care as a base from which she works to motivate him to want to get well and to use his abilities and all the resources and services available to him so that he can again lead a happy and a satisfactory life in his community.

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# Use of Corticosteroids for Protection Against Sunburn

By

LOTHAR WIRTH, M.D

**P**ROLONGED exposure to sunlight will lead to burns that will vary in degree. Protection against sunburn has been well covered in the medical literature. All stages have in common pain and discomfort.

Two reports made me consider corticosteroids in the prophylaxis against sunburn. One report came from one of my patients who was on corticosteroids for regional ileitis. When she was exposed to the tropical sun she noticed a "painless sunburn" with rapid tanning. The second report was an article on "Corticosteroid Therapy in the Treatment of Erythema Solare."<sup>1</sup> It was noticed that corticosteroids relieved cases of sunburn within four to six hours.

It is common knowledge that there is a time lapse of usually hours between exposure to sunlight and the appearance of sunburn.

The suggestion to use corticosteroids concomitant with exposure to sunlight seems natural. Once the initial sunburn can be mitigated, the subsequent pigmentation offers enough protection without further need for medication.

With this consideration individuals were placed on 10 mgm. of prednisolone every three hours for four doses while they were exposed to burning doses of an ultraviolet lamp. The expectation that a painless redness of the skin would occur was realized, as well as the appearance of accelerated pigmentation.

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## REFERENCE

<sup>1</sup>Younger, D., et al.: Corticosteroid Therapy in the Treatment of Erythema Solare. N.Y. State J. of Med., Sept. 15, 1958.



## NEW YORK CHAPTER MEETING

Officers Club, Governors Island, New York

Thursday, May 28, 1959

Cocktails—6:00 P.M. Dinner—7:00 P.M.

At 8:00 P.M. Lieutenant Commander John H. Ebersole, MC, USN, will speak on "Medical Problems of the Nuclear Submarine."

## Walter Reed Army Hospital Celebrates Fiftieth Anniversary

**O**N MAY 1, 1909, in the northwest section of Washington, D. C., a small hospital admitted its first patients for treatment.

Known as the Walter Reed United States Army General Hospital, its official opening was greeted with complete public disinterest.

No parades, band concerts, grand speeches, or dedicatory ceremonies marked the event. In fact, newspaper files for that period were completely devoid of any mention of the occasion.

Even the first patients—ten soldiers transferred from the Washington Barracks Hospital (on the present site of Fort McNair, D.C.)—probably were more annoyed by the necessity of moving from one sick bed to another than pleased at the prospect of taking part in military medical history.

But from this relatively unimpressive beginning there has emerged the present Walter Reed Army Hospital—world acclaimed as one of the country's best-known medical centers and a "high court of medical appeals" to thousands of servicemen and their families.

Famed for its care and treatment of scores of government officials and foreign dignitaries, the hospital's fifty years of service to mankind is truly expressed by the dedicated physicians, nurses, technicians and other supporting personnel who insist that the *Very Important Patient* at Walter Reed will always be the American soldier wounded in battle or suffering the ravages of disease.

Since its original opening with its ten patients, the Walter Reed Hospital has cared for more than 448,000 bed patients, not to mention the average of 1,000 persons who daily receive treatment in the hospital's modern Out-Patient Service. Its May 1, 1909 staff has increased from five medical officers, 62 corpsmen and three civilian employees to a current total of 1,021 military (including doctors, dentists, nurses, ward

attendants, technicians and administrative personnel) and 855 civilians.

Its plant has expanded from the original main building and three small separate structures to a present total of 226.

Annually 9,000,000 pounds of laundry are handled; more than nine miles of corridors are scrubbed and polished daily; there are more than nine miles of sidewalks and twelve miles of paved streets on the installation.

A day-nursery for children and clubs for non-commissioned and commissioned officers are provided. The theater has a special sloping ramp for convenience of wheelchair patients as does a branch office of Riggs National Bank. Often compared to a small city, with its churches, libraries, closed-circuit color TV network, newspaper, radio station, telegraph office, post office, guest house, police and fire departments, barber and beauty shops, service station, picnic grounds, recreation halls and swimming pools, Walter Reed Hospital offers to its patients and their families every convenience to aid recovery and speed their return to normal living.

But, far more important than the "special services" available is the reputation the hospital and its staff has earned on the professional level.

Formal residency programs with a view to certification of the trainee by an American specialty board started here in 1947. The hospital has been approved by the American Medical Association's Council on Education and Hospitals and is accredited by 21 of the 24 specialty boards. An active intern program is also carried on in the fields of medicine, dentistry, clinical psychology, physical therapy and occupational therapy. With its excellent staff and the newest in equipment, physicians come from all parts of the world to observe Walter Reed's methods and take advantage of its teaching program.

Through the years, the hospital has be-



come a mecca of medicine for many famous personages. Calvin Coolidge, son of the President, was a patient at Walter Reed in the early twenties. General of the Armies John J. Pershing was a Walter Reed "resident" for seven years in a third floor hospital suite which still bears his name.

Many Presidents have been hospitalized here—including the most recent, Harry S. Truman and Dwight D. Eisenhower—and many others visited patients regularly. Presidents Harding, Coolidge, Wilson and Hoover were often seen chatting with hospitalized servicemen.

Among foreign dignitaries hospitalized at Walter Reed have been General Manuel Odría of Peru; Field Marshal Sarit Than-

arat of Thailand; the little four-year old Prince Mashhur of Saudi Arabia; Bernhard, Prince of the Netherlands; U Win Maung, President of Burma; General K. S. Thimayya, Chief of Staff of the Indian Army; and Sir John Dill of Great Britain.

All of these individuals received the same excellent care available to the American soldier and his family. Whether the "VIP" be an Air Force jet pilot, Army infantryman or high-ranking government official, all speak with respect of Walter Reed. It is a respect earned through fifty years of service to mankind by personnel of the hospital whose only pride of accomplishment lies in a continuing desire to aid their fellow man with unity of purpose and humility.



# ARMY MEDICAL SERVICE CORPS COLONELS ATTEND SUPPLY INSTITUTE

(BROOKE ARMY MEDICAL CENTER, FORT SAM HOUSTON, TEXAS, MARCH 2-6, 1959)



*U. S. Army Photo*

(L to R) (Sitting). Colonels Guy C. Hill, Claude C. Britell, Lewis F. Williams, Bernard J. Kotte, Bernard Aabel (Chief of the Medical Service Corps), Richard Cannon, and Eli E. Damon.

(L to R) (Standing). Colonels James T. Richards, R. R. Quarton, James D. Galvin, Rex P. Clayton, Allen Pappas, Henry D. Roth, Eugene G. Cooper, Frank E. Stillman, Jr., Rufus D. Huff, Elwood W. Camp, Lawrence G. Alexander, Jr., and William A. Hamrick.

## EDITORIALS

### Armed Forces Day Prayer

**A**Lmighty God, The Father of us all, we give Thee most humble and hearty thanks for the blessings that

have been bestowed upon our Land. We are ever mindful of the devotion and sacrifice made by members of our Armed Forces on land, in the air, and on the sea. They have served in great jeopardy to insure for us

THE WHITE HOUSE

WASHINGTON

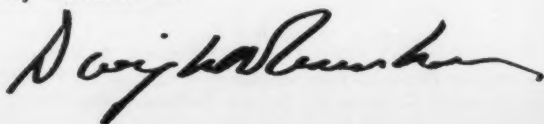
November 22, 1958

### ARMED FORCES DAY, 1959

Over the past decade, Armed Forces Day, the third Saturday of May, has become an important date in the calendar of the Nation. In the annual observance of this day, it is a privilege to join my fellow citizens together with the Army, Navy, Air Force, Marine Corps, Coast Guard, their reserve components and auxiliaries.

Assisted by national, State and local civil authorities and organizations, every effort will be made to increase public understanding of the role of our Armed Forces as a defensive shield serving in partnership with friends around the world. Toward this end, I know that the members of the Armed Forces will discharge their responsibilities with pride and purposefulness.

Armed Forces Day 1959 provides an opportunity for our people to demonstrate their belief in the constructive "Power for Peace" -- to which the Armed Forces of the United States are totally committed.



the freedoms we enjoy.

We petition Thy Heavenly Guidance upon the leaders of the Nation, both civil and military. Make them aware of their role in the redemption of the world from cruelty, hate and injustice, so that the exercise of our might will always serve the ends of justice upon this earth.

On this day we remember the individual soldier, sailor, airman, and marine. Keep them always courageous and vigilant in the faithful performance of their several duties. Give them such insight that they never glory in material might but remain faithful to the preservation of liberties and freedoms for all mankind.

Finally, we pray for Thy Heavenly Benediction as we join with those around the world who work toward the end that righteousness shall prevail among all the peoples of the world. Endow us with strength of character that prompts a devotion to our country and to Thee, O God, who is the source of all true power. Amen.

*Armed Forces Chaplains Board*

## Communicable Diseases

THE lack of attention toward established preventive measures which many people have shown is manifesting itself in the increased incidence of diphtheria and poliomyelitis. The evidence is to be found in the weekly *Morbidity and Mortality* reports of the U. S. Public Health Service.

Against diphtheria we have the toxoid, either combined with the tetanus toxoid and the pertussis antigen for children, or the

diphtheria toxoid alone for adults. There is little excuse, especially in the case of children, for diphtheria. The disease can be practically eradicated, but the reports show an increasing incidence.

The poliomyelitis rate is rising despite the availability of the Salk vaccine. Must the American people continue to witness epidemics of poliomyelitis through their own carelessness? It appears difficult to get some people to be immunized even though, as practiced in many communities, the vaccine is free. How can these people be reached? Probably not through any one means but rather a combination of methods determined by a thorough study of the habits of all classes. The effort is worth while as we have evidence now that the incidence of paralytic polio is far greater among those who have not received the Salk vaccine. In Detroit last year out of 312 cases of paralytic polio only 15 of these persons had received the Salk vaccine.

The months of the higher incidence of polio are approaching rapidly. An intensive campaign is necessary to get the two recommended injections into each unvaccinated person under 40 years of age prior to the seasonal high incidence of the disease. Two injections at two to four week intervals, and a third injection seven months later are recommended.

In the interest of the national welfare people should be protected against this crippling disease which has cost the lives of many, the crippling of many more, and brought great burdens to individuals and families. To remain unvaccinated in the face of these threats is unwise.



# The Association of Military Surgeons of the United States

*Founded 1891, Incorporated by Act of Congress 1903*

*Suite 718, New Medical Bldg., 1726 Eye Street, N.W., Washington 6, D.C.*

*Telephone NAational 8-2206*

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## PROPOSED AMENDMENT TO THE BY-LAWS OF THE ASSOCIATION OF MILITARY SURGEONS OF THE UNITED STATES

Action will be taken by the members of the Association of Military Surgeons at the 66th Annual Convention, November 9-11, 1959 on the following proposed amendment to Section 5 of Article XII of the By-laws:

"In order to provide sufficient capital for meeting contingent or expected payments from the Retirement Fund, the Executive Council (a) may at its discretion pay to the Treasurer of the Retirement Fund from the funds of the Association such amounts from time to time as the Council deems suitable, and (b) may at its discretion from time to time change the percentage of the current income of the Association to be set aside for the Retirement Fund, provided said percentage shall not be less than four percent (4%) nor in excess of eight percent (8%)."

### SECTION 5, ARTICLE XII OF THE BY-LAWS PRESENTLY READS:

"The Retirement Fund shall be constituted by setting aside and paying to the Treasurer of the Retirement Fund Trustees four percent (4%) of the current income of the Association, including all of any income or funds set aside and specified to be for said fund, including accretions on the capital belonging to said fund but excluding accretions on the capital of the Association which are not a part of said Fund."



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## The Sir Henry Wellcome Medal and Prize

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### COMPETITION FOR 1959

THE competition is open to all medical department officers, former such officers, of the Army, Navy, Air Force, Public Health Service, Veterans Administration, The National Guard and the Reserves of the United States, commissioned officers of foreign military services, and all members of the Association, except that no person shall be eligible for a second award of this medal and prize and no paper previously published will be accepted.

*The award for 1959, a medal, a scroll, and a cash prize of \$500, will be given for the paper selected by a committee composed of the Association's vice-presidents which reports on the most useful original investigation in the field of military medicine. The widest latitude is given this competition, so that it may be open to all components of the membership of the Association. Appropriate subjects may be found in the theory and practice of medicine, dentistry, veterinary medicine, nursing and sanitation. The material presented may be the result of laboratory work or of field experience. Certain weight will be given to the amount and quality of the original work involved, but relative value to military medicine as a whole will be the determining factor.*

Each competitor must furnish six copies of his paper which must not be signed with the true name of the author, but are to be identified by a *nom de plume* or distinctive device. These must be forwarded to the Secretary of the Association of Military Surgeons of the United States, Suite 718, 1726 Eye St. N.W., Washington 6, D.C., so as to arrive at a date not later than 20 June 1959, and must be accompanied by a sealed envelope marked on the outside with the fictitious name or device assumed by the writer and enclosing his true name, title and address. The length of the essays is fixed between a maximum of 10,000 words and a minimum of 3000 words. After the winning paper has been selected the envelope accompanying the winning essay or report will be opened by the Secretary of the Association and the name of the successful contestant announced by him. The winning essay or report becomes the property of the Association, and will be published in *MILITARY MEDICINE*. Should the Board of Award see fit to designate any paper for "first honorable mention" the Executive Council may award the writer life membership in The Association of Military Surgeons, and his essay will then also become the property of the Association.

## Around the World

(Ser. III, No. 7)

By

CLAUDIUS F. MAYER, M.D.

GERMANY, according to a recent statement of a bacteriologist who has first-hand information on the subject, lost the Second World War because the *Africa Corps* of Rommell was destroyed. And the *Africa Corps* was destroyed because the soldiers of this famous organization had loose bowels. The description of the bacteriologist shows how the entire corps became the victim of a combined infection with *Flexner bacillus* and *Entamoeba histolytica*. Soldiers who became sick in the dugouts were not allowed to leave their trenches, and thus the fecal material quickly made their living quarters unsanitary and uninhabitable. Millions of flies took care of the quick spreading and growth of the army of germs. Everything became contaminated. It was truly a self-made *bacterial warfare*. The combined infection of dysentery was soon strengthened by the virus of *infectious hepatitis*. All this happened before the introduction of the sulfa drugs in the German military pharmacopoeia. Dysentery epidemics followed one another in quick succession from 1941 to 1945, and the invincible *Africa Corps* succumbed to the attacks of powerful pathogenic germs.

The publishing business is still not what it used to be in Germany. Publishers do not like to take chances with budding authors, and much research material remains buried in the drawers. Hence, the *German Research Association* announced the creation of a "library" which will only contain unpublished scientific reports in manuscripts. Those who wish to consult the material may obtain photostatic copies of the documents. The center will function at Frankfurt a.M. under the title "*Archives of Unprinted Scientific Writings*" (*Archiv ungedruckter wissenschaftlicher Schriften*).

Among the major achievements in the field of medical instrumentation we find a *cardiac*

*catheter with a photoelectric microcell*, made in Germany, as an indication of the increased efforts in the field of research into cardiovascular diseases.—By the way! An analysis of *cardiovascular mortality*, made by the World Health Organization, showed that the mortality rates from cardiovascular diseases were the lowest in the *Latin American* countries (Guatemala, Mexico, Colombia, Costa Rica, Chile). Belgium, France, Norway and the Netherlands were next, while the highest death rates from these diseases were found in Finland, Australia, and the United States. We may be almost sure that these statistical complications are fundamentally wrong, partly because of the non-standard practice of filling out the death certificates.

During the first six months of last year (1958) a good number of *medical people* escaped from *Eastern Germany*, according to reports arriving from Western Germany. Among the refugees they counted 621 physicians, 44 university professors, 122 lecturers and assistant professors, and more than 100 medical students. A member of the Communist Central Committee wondered how it was possible that even at the time of the most rigid class war the Soviet government had been able to collaborate with the "intelligentsia" while similar collaboration had not been attempted in the Soviet Zone of Germany.

At Koldby, *Denmark*, an unusual accident happened to a *blood donor*. He died as a result of blood donation. Recently he had volunteered to give blood. At first, the blood ran freely from his arm, then it stopped. The attendant withdrew the needle, and made a fresh puncture. Nobody noticed that the stylet of the needle had entered the vein. A few days later, the donor felt some pain in his arm, and the doctor found signs of phlebitis. Four weeks after the donation, the donor complained of shortness of breath,

and two days later he suddenly died while riding in his automobile. Autopsy revealed thrombophlebitis of the distal portion of the brachial vein, and the *stylet was found in the right ventricle* of the heart; one end of it was embedded in a papillary muscle, and the other had perforated the myocardium and pericardium posteriorly. The heart sac contained 200 ml. of blood.

Studies of parturients from Northern and Southern Karelia in East Finland show that, in a sparsely populated country, the *obstetric case material* may differ widely from one part of the country to another. Northern Karelia is lower in social and economic status than Southern Karelia, and women of this area also have their deliveries in less favorable ways; they have more premature babies, they suffer more often from toxemia of pregnancy, from puerperal infections, and hemorrhages. Mothers in Northern Karelia easily become anemic, they have more cases of varicose veins and thrombophlebitis, and—which is very surprising—they need Cesarean sections for their deliveries more often than the lucky women in Southern Karelia.

In Sweden, the medical authorities again *condemned the fluoridation of water*. A special commission recommended that the Swedish government should prohibit the application of this anti-carries measure in that country. The commission has some doubts about the innocuousness of fluoridation as a preventive measure. Actually, the Royal Commission stated that those who want to go ahead with adopting this measure should be allowed to do so. They add that it is true that one mg. of fluoride per liter of water would be able to prevent caries provided that the person would be using the same water throughout his whole life. In other words, the preventive results entirely depend upon the regularity of fluoride uptake by the organism.

A professor of philosophy in *Madrid* and his students try to determine the basic objectives of science in the next half of our century. Whether he will succeed in his endeavour or not, it seems to be immaterial; he has already created a new word for his

particular field of study. He calls it "*preology*" or *the Science of Man's Future*. As usual with a newborn science, it will soon have its international congress which is now being organized by the philosopher.

A recent *Italian law* has established a new ministry, the *Ministry of Health* which will include in its sphere of activities the general direction of (a) administrative and personnel affairs, (b) services of the public health and of the hospitals, (c) services of social medicine, (d) pharmaceutical service, (e) veterinary service. It will be also the headquarters of the Supreme Health Council (Consiglio Superiore di Sanità). The National Institute of Health (Istituto Superiore di Sanità) is also subordinated to the new ministry. The new State agency will also take over the entire regional and provincial and municipal organizations of public health. Until now, the public health affairs had been managed by a High Commission for Hygiene and Public Health.

At the International Congress of Apiarists (*Bee Keepers*), held last September in Bologna and *Roma*, several members of the congress called attention to the wonderful *medicinal virtues of the "royal jelly"* which the queen bee produces. A German doctor found that it has a favorable influence upon the blood-forming and the reticulo-endothelial systems. Another doctor, an Italian psychiatrist, observed that intravenous administration of the liquefied jelly would cure certain cases of schizophrenia. A Bolognese pharmaceutical company has already become interested in the commercial production of the royal jelly!

The *first neurosurgical chair in Italy* was established at the University of Milano. It was unanimously offered to Paolo Emilio MASPEs who has been known for his work in this particular field of neurology.—The new Pope is just as much interested in science and medicine as his predecessor. A proof of his medical interest is that during last Christmas *Pope John XXIII* visited two ancient Roman hospitals, one of them the *Holy Ghost Hospital*, established during the Middle Ages. In the Child Jesus Hospital, which is of course for children, the Pope

blessed the newly installed radiographical apparatus.

*Italian flyers* do not want to remain behind their American colleagues. They also assert that some of them had the sensation which American flyers (Clark & Graybiel) had described in 1957 as the "*break-off phenomenon*." This is a peculiar sensation which some of the solo flyers may feel when flying at a great altitude (above 30,000 feet) and having no other sensory stimuli such as radio contact, panoramic vision, etc. The sensation is described by those who experienced it as "living in another world already," "having broken the terrestrial shackles and being in space." Some of the flyers feel omnipotent as if they were giants, mighty kings, able to do grandiose things; others feel that they are "near God." Those who never felt this phenomenon are apt to call the others "loony."

From a brief letter sent to the Editor of the British Medical Journal it seems that there may be *more hazards in viewing football games* than playing the game itself. During a recent game, an old man developed cerebral thrombosis and died the next day; two other men died from coronary thrombosis on the way home after watching the game, while a young man with mitral stenosis collapsed while watching the game in the gallery, and died from coronary thrombosis. As an addendum to this item, we mention that follow-up studies of former university athletes (in the U. S.) showed that those who kept on with *active and strenuous physical exercises* throughout the rest of their lives did not seem to get coronary disease.

A further interesting report on the same topic is the observation that *drivers of the London double-deck busses* were more likely to die from sudden coronary thrombosis than the conductors, and that Government officials were suffering more often from rapidly fatal cardiac infarction than did the postmen. This was shown by a survey in *Great Britain* which also tried to clarify the relationship between *coronary heart disease and physical activity of work*. From a lot of figures and studies, and from the

many questionnaires which the British pathologists answered it can be now stated very clearly and definitely that physical activity of work is a *protection against coronary* (ischaemic) heart disease. Men in physically active jobs have less coronary heart disease during middle-age; what disease they have is less severe; and they develop it later than men in physically inactive jobs. This allows the speculation that habitual physical activity is a general factor of cardiovascular health in middle-age. This would put coronary disease into the group of *deficiency diseases*. The hearts of sedentary and light workers age much quicker than the hearts of heavy workers. Perhaps, the diminishing physical activity of work during the present century may be one of the causes of the increasing incidence of coronary heart disease. How about the "underdeveloped" peoples who become "westernized"?

A couple of years ago, the Arteriosclerosis Commission of the *Swiss Academy of Medicine* organized a *Symposium on Arteriosclerosis*. The aim of the symposium was to throw light upon the disease which makes so much difficulty for the doctor. It is hardly manageable by treatment. More than 200 scholars gathered from all parts of the world, and it became evident that basic differences exist in the American and European concept of the disease. The Americans are more interested in the biochemical aspects of the disease, while the Europeans try to emphasize the morphological and haemodynamic aspects of arteriosclerosis. The proceedings of the Symposium filled a double issue of the Swiss Academy's Bulletin.

The organization of the *Military Medical Service of Switzerland* includes eight so-called "Military Sanitary Establishments" (*établissement sanitaire militaire*, or ESM) each of which plays the role of a base hospital, and has the necessary personnel and organizational echelons. An ESM can take care of 3,000 wounded and sick. Among the 8 ESM-s, four are called "advanced," and four are "rear." An ESM includes 4 groups each of which has facilities of transportation

and a hospital for 750 sick and wounded. The first group of an ESM is "mobile" because the motorized transportation units and a hospital train are attached to it. The staff of an ESM includes about 2,000 persons, officers, non-coms, male and female volunteers, and the detachments and columns of the voluntary sanitary service. Groups 2, 3 and 4 of an ESM are called "hospital" groups.

On 6-11 October, 1958, one ESM unit was mobilized in *Central Switzerland* for an extraordinary training course, and for a large scale exercise. The assumption was that an *atomic attack* was made at the *upper region of the Zürich Lake*. The ESM established itself in the caves and underground localities, and 24 hours after the *mobilization*, the entire ESM was in a functional capacity. It was interesting to see that, in the time of 40 hours, the group was able to convert the existing railroad facilities into a regular hospital train, equipped with operating room, place for sterilization, and with modern canteen. The train was ready to admit 356 wounded and sick, and surgical interventions could be performed in its operating room. The exercises were inspected by the Swiss Surgeon-General (Col.-Brigadier Meuli).

Observations at the *Aviation Medical Institute at Dübendorf*, Switzerland, show that very few neurotic people make good pilots. It was especially interesting to learn that sons of pilots who had had fatal accidents in peace-time missions were especially poor at pilot training. Indeed, the conclusion may be drawn that only an *emotionally unbalanced man* would seriously consider becoming a pilot *after his father's death* in a peace-time flying mission.

The chairman of the Central Council of Trade Unions in *Poland* complained that so large was the number of unjustified absences from work in the first half of 1957 that about 26 million man-hours were lost to national economy. Such *absenteeism* was blamed on many things, including Gomulka's liberalization, the workers' rebellion against the prospects of lowered living standards, alcoholism, irresponsibility, etc. But, actually

a large percentage of the workers who report "sick" are trying to earn money elsewhere. Thus, in a harvesting factory in *Poznan*, over 20% of the staff fails to report daily. Moreover, as Polish dailies stated, doctors, both those working in the factories and those in the general health service, *grant sick certificates too willingly*, allowing themselves to be "bamboozled."

Complete reorganization of the *Hungarian National First-Aid (Rescue) Service* has been going on for years. Now, the entire country is a single network. The ambulance cars have been redesigned, and a huge automobile park was established with about 300 ambulances for the entire country. The network also has regional centers. The ambulance cars are manufactured in Poland according to the blue-print of engineers in Hungary. Each car can carry two stretchers, a driver and an attendant.

During the last decade much experimental work has been done on the prevention and *treatment of radiation sickness*. Among the most recent experiments we mention those of the Curie Foundation at Paris. In a recent conference it was revealed that four Parisians volunteered for the donation of *bone marrow* when *five Yugoslav scholars* received an overdose of radiation at the Yugoslav Center of Nuclear Studies at Vinca (Yugoslavia). The bone marrow of the donors was removed by drillings of their sternal and pelvic bones. The marrow was made into a thick fluid which contained billions of medullary cells. This fluid was given to the victims in the form of intravenous infusion. One of the 5 patients died; the others fully recovered. This is the first successful transplantation of the bone marrow, according to the authorities of the Curie Foundation.

Among the international losses of medicine we mention the recent death of W. LUTZ, dermatologist at the Basel University (1889-1958) who wrote a textbook on skin diseases, and was the editor of the journal *Dermatologica*; Cyril William JENNER (1884-1958), a doctor in Haslemere, Surrey, was the great grand-nephew of the celebrated Edward Jenner, the pioneer



of vaccination against smallpox; Hugh CRICHTON-MILLER (1877-1959), British psychiatrist, was the founder of the Tavistock Clinic at London, and a pioneer of "New Psychology." He used to say that a patient had to be examined and treated with "binocular vision," that is, with a view of the physical and the mental aspects of his illness. The nestor of Hungarian pathologists, Béla ENTZ (1877-1959) also died in January. In the Soviet Union, medicine lost the 77-year old ORBELI, the physiologist, who in 1950 was censored by the Soviet Academy of sciences because he dared to doubt the value of some observations of Pavlov. Italy lost Prof. R. PAOLUCCI (66 y. old), head of the Surgical Clinic of the Roman University. Jean LHERMITTE (82 y. old, died 24 Jan. 1959), French neuropsychiatrist, will be remembered for his researches on the physiology of brain, of vision, etc.

According to a *survey of latrines in the Western Hemisphere*, it was found that, excluding the U.S. from the figures, there are 5,772,000 houses in the *urban districts* of 12 countries of which 1,080,000 are in need of sanitary installations. In the *rural districts* of 9 countries of the Latin Americas, 11,211,000 houses were counted out of which 8,400,000 do not have any proper disposal for human excreta. During the last 15 years, the Rockefeller Foundation was the chief source of money for the erection of latrines all over the world. In Latin America, the cost of a latrine may be anywhere between 56 cents (in Paraguay) and 60 dollars (in Venezuela). The average price is between 6 and 9 dollars. Mostly used are the prefabricated latrines, but in many places they are constructed *in situ*. (By the way! some of that Rockefeller money would be welcome in the U.S. itself. The U.S. has 46,000,000 houses, and there are still 194,000 urban and 755,000 rural houses without a toilet or a privy (1950 data).

During the *Cuban Civil War*, on the fourth of July of last year, Mr. Fidel Castro sent a telegram to the International Red Cross Committee in Geneva in which he told that, owing to the lack of adequate means, he

was unable to provide adequate care to the wounded and sick of the Government troops whom he captured. He *requested* that he be allowed to *send these soldiers to a commission of the Cuban Red Cross*. Negotiations started between the Red Cross delegate, who arrived in Habana on 10 July, and the authorities of the Cuban Army and the Cuban Red Cross. A plan of evacuation was elaborated, and safe-conduct was guaranteed to the rebel trucks transporting the wounded. Fidel Castro thus delivered 253 of his sick and wounded prisoners 57 of whom had to be immediately carried away by helicopters from the jungle. There were several further occasions for such acts of humanity, at which time the Cuban Red Cross had also given medicaments to Castro's rebels in exchange for the wounded prisoners.

From July 1, 1959 until June 30, 1960 a *World Refugee Year* will be opened under the auspices of the United Nations. The year wishes to concentrate the world's interest on refugee problems of all types, including repatriation, resettlement, and the humanitarian aspects of the problem.

Doctors in *British Hospitals* became very much *decoration-conscious*. In a hospital, the anesthesia room was recently decorated so that a fabulous fresco was painted on the ceiling which was supposed to keep the mind of the patients off the medical doings. As far as we remember this painting was a scene of a countryside, with farm, and farmers, and cattle and sheep some of which were jumping over a fence. Now, a correspondent of the British Medical Journal believes that such plain paintings and decorations are not valuable. "Once you have identified on the wall Mickey Mouse, or the Cow Jumping over the Moon"—as he puts it—"you lose interest in them, and in a very short time will cease to notice them, so that they might just as well not be there at all." What is needed is to have abstract pictures of the type painted by Picasso, Braque, and Kandinsky on the hospital walls. Such paintings would provide a permanent never-ending interest to the bedridden patient. So, down with Mickey Mouse, and *up with Picasso in pediatric wards! . . . Multa paucis!*

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It is a privilege to list the firms who have joined The Association of Military Surgeons as Sustaining Members. We gratefully acknowledge their support.

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## NOTES

Timely items of general interest are accepted for these columns. Deadline is 3rd of month preceding month of issue.

### Department of Defense

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FRANK B. BERRY, M.D.

*Deputy Ass't Sec'y*—HON. EDW. H. CUSHING, M.D.

#### DRAFT EXTENDED

A four-year extension of the draft bill has been enacted into law which now sets ahead the termination of the draft to June 30, 1963.

Under the provisions of the law the special pay for physicians, dentists, and veterinarians is also included.

#### SELECTIVE SERVICE

The Department of Defense has requested the Selective Service System to provide Armed Forces Induction Stations with 6,000 men during May for assignment to the Army.

#### ARMED FORCES

Total numerical strength of the Armed Forces on January 31, 1959 (based on preliminary reports) was 2,560,483. This represents a decrease of 5,440 from the December 31, 1958 strength of 2,565,923.

### Army

*Surgeon General*—MAJ. GEN. SILAS B. HAYES

*Deputy Surg. Gen.*—MAJ. GEN. JAMES P. COONEY



U.S. Army Photo

MAJ. GEN. LEONARD D. HEATON, MC, USA

#### APPOINTMENT AS SURGEON GENERAL

Major General Leonard D. Heaton will succeed Major General Silas B. Hays as Surgeon General of the Army on June 1.

General Heaton, a native of West Virginia, was selected for this high position by President Eisenhower. Public announcement was made on April 7.

The new Surgeon General attended Denison University, Granville, Ohio, from 1919 to 1922, and then entered the University of Louisville School of Medicine from which he graduated in 1926.

He accepted a commission in the Medical Corps of the Army and entered on active duty July 17, 1926 as an intern at Letterman General Hospital, San Francisco. In the years to follow he specialized in surgery. When the Japanese struck Pearl Harbor in 1941, General Heaton was stationed in Hawaii and became busily engaged in the treatment of the

many casualties. During World War II he served as Executive Officer at Woodrow Wilson General Hospital, Staunton, Virginia, and later in Europe as a hospital commander. From 1946 to 1949 he was Chief of the Surgical Service and Chief of the Professional Services at Letterman Army Hospital and then took command of the hospital in 1950.

In April 1953, General Heaton assumed command of the Walter Reed Army Medical Center, Washington, D.C. While attending to the heavy administrative duties which befall a commanding officer at such a large center he has still kept up his interest in the actual practice of surgery. His proficiency in his specialty held him in good stead when called upon to perform surgery on President Eisenhower and Secretary of State Dulles.

General Heaton has been awarded the Distinguished Service Medal and the Legion of Merit with two Oak Leaf Clusters. He is a Fellow of the American College of Surgeons and a Diplomate of the American Board of Surgeons.

#### GENERAL HAYS

Major General Silas B. Hays, present Surgeon General, is expected to retire later this year.

#### GENERAL SCHWARTZ PROMOTED

Major General Jack W. Schwartz was recently promoted to that rank in a temporary grade. General Schwartz is the Commander of the Tripler Army Hospital in Hawaii, having assumed that position on April 23, 1958.

A native of Ft. Worth, Texas, he entered the Army Medical Corps as an intern after his graduation from the University of Texas School of Medicine in 1928. During World War II he was a prisoner of war when captured in the Philippines by the Japanese. He was assigned to the Letterman Army Hospital where he was Chief of Urology from 1946 to 1953. Later assignments included Walter Reed Army Hospital and Madigan Army Hospital.

#### VISITS KOREA

Major General James M. Epperly, Chief of the Dental Corps, recently made a three-week tour of the dental installations of the Far East. During this time he was a visitor in Korea where he inspected the U.S. Army Advisory Group dental facilities.



(L to R) COL. ROY L. BODINE, JR., USARPAC dental surgeon; BRIG. GEN. JOONG YONG RAE, ROK Army dental surgeon; MAJ. GEN. JAMES M. EPPERLY, Chief, U. S. Army Dental Corps; Unidentified soldier.

#### ASSIGNMENTS IN SGO

Lt. Colonel Frederick W. Hastings, MSC, has been appointed Assistant Chief of the Medical Facilities Branch in the Medical Plans and Operations Division, Office of the Surgeon General.

In 1955 Colonel Hastings received a Master's degree in architecture from Yale University. The position to which he has been assigned has responsibilities in connection with the construction, leasing and maintenance or alteration of physical facilities of the sick and wounded in the Army.

Major LaRay D. Hooker, MSC, was recently assigned as Chief of the Personnel

Actions Section, Personnel and Training Division, Office of the Surgeon General.

#### PROMOTED

The Deputy Surgeon, U.S. Continental Army Command, Fort Monroe, Virginia, Colonel Francis L. Carroll, was recently promoted to that rank.

Colonel Carroll received his Doctor of Medicine degree from Cornell University Medical School in 1931 and then entered private practice in Oswego, New York. During World War II, he served as executive officer of the 24th Field Hospital in the Southwest Pacific, and after the war re-



U. S. Army Photo

(L to R) MRS. F. L. CARROLL; COL. F. L. CARROLL; COL. JOSEPH G. COCKE, SURGEON, USCONARC.

sumed private practice. With the onset of hostilities in Korea he again entered the Army and was commanding officer of an evacuation hospital and surgeon for the IX Corps in Korea. In October 1958 he went to his assignment at Fort Monroe from the 39th Medical Group at Fort Devens, Mass., where he was commanding officer.

#### BOVARD AWARD CORRECTION

An error occurred in the item which appeared in the March issue of *MILITARY MEDICINE* regarding the Bovard Award made to Major Ruth Edenfield, Army Nurse Corps, Letterman Army Hospital.

This second Bovard Award was presented to Major Edenfield by Colonel Robert Skelton, the founder of the Bovard Award, and not by Colonel Skinner as stated in the above mentioned item. Our apologies to Colonel Skelton.

#### GENERAL RANK FOR MSC

A bill (HR5393) has been introduced by Representative Carl T. Durham (D-NC) which provides for major general rank for the Chief of the Medical Service Corps of the Army. The bill also provides for positions in the grade of brigadier general.

#### ARMY STRENGTH

Army procurement during January totaled 25,723—with 9,792 inductions through Selective Service; 9,529 new recruits; 5,931 reenlistments and 471 reservists entering upon active duty. Army strength was estimated at 889,046.

#### HELICOPTER

Development of a new Army transport helicopter to be called the YHC-1-B, "Chinook," is in the offing.

The Army said that it will negotiate with the Vertol Aircraft Corporation of Morton, Penna., to develop the two to three ton capacity copter, which will be a tandem rotor, turbine-powered craft with a rear-loading ramp.

Expected to carry up to 40 troops, the "Chinook" will eventually replace the Army's current inventory of obsolescent piston-engine transport helicopters.

#### MINIATURE LIGHT AND RADIO

An electric light slightly larger than a pinhead and a radio transmitter the size of a pencil eraser have been announced by the Department of the Army.

The lamp could be used in medical instruments although it was designed for control panels in missile research and electric computers.

The transmitter will be used in ballistic studies.



## Navy

*Surgeon General*—REAR ADM. BARTHOLOMEW W. HOGAN

*Deputy Surgeon General*—REAR ADM. BRUCE E. BRADLEY

### ASSIGNMENTS IN BUMED

Captain Neil J. Overton, D.C., has been assigned to the Bureau of Medicine and Surgery for duty as Promotions and Qualifications Officer, Personnel Branch, Dental Division.

Lieutenant Commander John T. Craighead, MC, has been assigned as a Medical Member of the Physical Review Council.

In the Medical Service Corps Division, Bureau of Medicine and Surgery, two positions have been established which will at this time be filled as additional duty assignments by officers on duty in the Washington area. Lieutenant Commander Elizabeth O'Malley, MSC, on duty at the U.S. Naval Hospital, Bethesda, will be Assistant for Women's Specialists Section officers; and Lieutenant William H. Woolf, MSC, U.S. Naval Dispensary, Washington, will be Assistant for Podiatry officers.

### VISITS NNMC

On a scheduled tour of naval facilities in the United States Rear Admiral Juan A.



*Navy Photo*

(L to R) CAPT. JOHN H. CHEFFEY, MC, USN; REAR ADM. JUAN A. PIZARRO; and CAPT. F. P. KREUZ, JR., MC, USN.

Pizarro, Commandant of the Columbian Navy, visited the U.S. Naval Hospital, National Naval Medical Center, Bethesda, Maryland.

He was met by Captain F. P. Kreuz, Jr., Commanding Officer of the U. S. Naval Hospital at the Medical Center and Captain John H. Cheffey, Chief of the Orthopedic Service.

### NUCLEAR NURSING COURSE

The second class in Nuclear Nursing now being held at the U. S. Naval Medical School, National Naval Medical Center, Bethesda, Maryland, opened on March 16. It is expected that the four month curriculum will be completed, and graduation ceremonies will be held on July 3, 1959.

In charge of the class are: LCDR L. Simon, NC, USN, Head of the Division of Nuclear Nursing, and Lt. S. McGinniss, NC, USN, Assistant to Head, Division of Nuclear Nursing.

The twelve students attending the course are: Lieutenant Commanders M. Kloetzle, D. Mink, and Bessie Weeder, Nurse Corps, U. S. Navy; Major J. Sellars, Army Nurse Corps; Captains R. Aquino (Philippine Army), R. Hall, Army Nurse Corps, and E. Hullfish, USAF (NC); Lieutenants M. Cusson, Royal Canadian Navy, E. Hebb, Royal Canadian Navy, and R. Stephens, USAF (NC); Miss S. Chase, Assoc. Professor of Nursing, University of Colorado, and Mrs. B. James, Veterans Administration, U.S.

### RETIRED

Captains Charles F. Lynch and Robert W. Wheelock, Dental Corps, were placed on the Retired Officers List of the Navy.

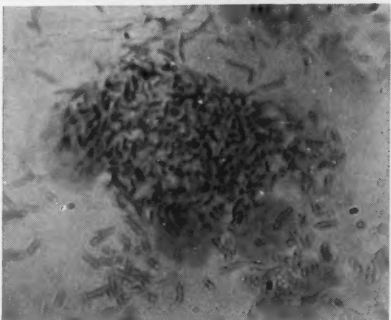
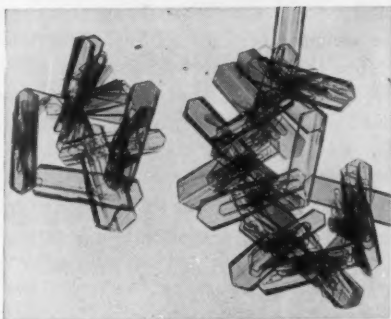
Four Medical Service Corps Officers were retired on April 1: Lieutenant Commanders Winston B. Copeland, B. F. Edington, and George E. Thorsell; and Lieutenant R. M. Roberts.

### LONG DISTANCE HEART BEATS

The first trans-Pacific cable transmission of actual heartbeats and electro-cardiograms

AN IMPORTANT CONTRIBUTION TO THE TREATMENT OF LEPROSY...

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- does not cause depression; may produce a sense of well-being.
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of heart patients recently took place from Tripler Army Hospital in Hawaii when Governor William F. Quinn of Hawaii was "wired" to an electrocardiograph which transmitted his heart beats by telephone from Hawaii to Montgomery, Alabama, a distance of 4,000 miles.

Those conducting the test were Lieutenant Commander Edward W. Bird who was assisted by HM2 David Vaughn, both of Tripler's Navy Medical Unit.

## Air Force

*Surgeon General*—MAJ. GEN. OLIVER K. NIESS

*Deputy Surg. Gen.*—MAJ. GEN. OLIN F. McILNAY

### ASSIGNMENTS

Brig. General John R. Copenhaver has been assigned to Langley Air Force Base, Virginia as Surgeon, Tactical Air Command.

Colonel William F. Patient, USAF (MC) has been assigned as Surgeon of the Alaskan Air Command which was the position held by Brig. General Copenhaver prior to his transfer to the Virginia station.

### AWARDS

Colonel Jack C. Carmichael, USAF (MSC), was presented the Legion of Merit on March 13 by the Surgeon General of the Air Force, Major General Oliver K. Niess. This award was made for meritorious service as Chief of the Engineering Branch and the Environmental Health Laboratory Branch, Office of the Surgeon, Air Matériel Command, during the period July 1954 to July 1958.

Colonel Ralph M. Lechause, USAF (MC), Chief of Nuclear Medicine, Office of the Air Force Surgeon General, received the Legion of Merit for meritorious performance of duty as Surgeon of Joint Task Force 7 during 1958 nuclear tests in the Pacific. The presentation of this award was made by Major General Niess on March 13.

Colonel Herbert W. Coone, USAF (MC), Internal Medicine Consultant to the Surgeon General of the Air Force, was presented with the Air Force Commendation Medal on March 13 by Major General Oliver K. Niess. This award was given for his meritorious service as Chief of the Professional Services and Deputy Commander of the Air Force Hospital at Wiesbaden, Germany, from February 1956 to December 1958.

### GIVES LECTURE

Major General Otis O. Benson, Jr., Commandant of the School of Aviation Medicine at Randolph Air Force Base, Texas, gave the annual Dr. James M. Anders Lecture before the College of Physicians in Philadelphia, April 1. His topic was "Man in Space—The Medical Problem."

### HOSPITAL

Headquarters of the 635th USAF Hospital, a 1,000-bed reserve hospital of the Air Force, are located at 346 Broadway, New York City 13.

The Commanding Officer of the hospital is Colonel Wilbur A. Smith; the Deputy Commanding Officer and Director of the Professional Services is Colonel Milton Greenberg, both of whom are practicing physicians in New York.

## Public Health Service

*Surgeon General*—LEROY E. BURNET, M.D.  
*Deputy Surg. Gen.*—JOHN D. PORTERFIELD, M.D.

### MODEL ORDINANCE AND CODE FOR MILK

Milk produced in accordance with the Public Health Service Model Ordinance and Code is safe and of high quality.

Most bacteria in milk are harmless. The standard recommended by the Public Health Service limits bacterial counts to a maximum of 200,000 per cubic centimeter in raw milk which is to be pasteurized. For pasteurized

milk delivered to the consumer, the Public Health Service standard has a maximum limit of 30,000 per cc.

The Public Health Service standards are currently used by 1,900 communities and 35 States.

#### HEALTH STATISTICS ON INJURED

*Persons Injured by class of accident* (PHS Publication No. 584-B8) is a 62-page booklet with diagrams and tables giving the statistics for the period of July 1957-June 1958, on the number of persons injured, class of accident, and days of disability due to injuries, by age, sex, residence, family income, and major activity. The information is based on data collected in household interviews during the period mentioned.

Here are some of the statistics: about 47 million persons received injuries that involved medical attention or caused them to restrict their usual activities for at least a day; males accounted for about 27 million of the injured and females for about 20 million. About 10 percent of those injured were in "motor-vehicle" accidents; 17 percent, "while at work"; 41 percent in "home" accidents; and 32 percent, in "other or unknown" types of accidents or nonaccidental incidents. Males in the 15-24 age group were injured at the rate of 482 per 1,000 persons per year, a higher rate than for any other age-sex group. Among females the highest rate (319 per 1,000 persons) was for those 65 years and over. When classified by major activity the highest rate (335 per 1,000 persons) occurred among persons going to school.

#### SEAT BELTS

All vehicles owned and operated by the Department of Health, Education, and Welfare will have seat belts installed as rapidly as possible.

A continuing accident study conducted by the Cornell University Automotive Crash Injury Project has shown that of the 30,000 lives lost annually in motor vehicles, 5,500 could be saved by the use of seat belts.

#### RETIRED

The following Commissioned Officers of the Public Health Service have retired: Medical Directors Walter S. Mozden, James B. Ryon, and Victor H. Vogel; and Sanitary Engineer Director Edmund C. Sullivan.

#### QUADRUPLE VACCINE AVAILABLE

A four-in-one antigen designed to immunize pre-school children against polio, whooping cough, diphtheria, and tetanus was licensed for production by the Public Health Service on March 25.

These combined antigens are designed for administration only to young children. There will be a limited quantity of this new vaccine available for the present. Since the polio season is bearing down on us parents should not wait to immunize with this new vaccine but should use the present polio vaccine which is in ample supply.

#### SNAKES AND ENCEPHALITIS

Garter snakes can be infected readily with western equine encephalitis virus according to investigators Thomas, Eklund, and Rush of the Rocky Mountain Laboratory, Hamilton, Montana.

The mosquito-bird cycle has been established. Now it appears that there may be a mosquito-snake cycle as it has been shown that the *Culex tarsalis*, mosquito vector of this virus, overwinters in rock piles where many snakes also hibernate.

#### REPRESENTS ASSOCIATION IN PARIS

Dr. Stanley J. Sarnoff of the National Institutes of Health, Bethesda, Md., represented the Association of Military Surgeons of the United States at the 21st Session of the International Office of Documentation of Military Medicine held in Paris, April 1-5, 1959.

Dr. Sarnoff delivered a paper entitled "Analysis of Basic Performance Characteristics and Design of Devices for Emergency Self-Injection—The AtroPen Auto Injector."

## Veterans Administration

*Chief Medical Director*—WILLIAM S. MIDDLETON, M.D.

*Deputy Chief. Med. Dir.*—R. A. WOLFORD, M.D.

### REAPPOINTED CHIEF MEDICAL DIRECTOR

Dr. William S. Middleton who has served for four years as Chief Medical Director of the Veterans Administration was reappointed for a four-year term, effective March 1, 1959.



*Veterans Administration*

DR. WILLIAM S. MIDDLETON

He is a native of Norristown, Pa., and received his medical degree from the University of Pennsylvania in 1911. In 1912 after an internship at Philadelphia General Hospital, Dr. Middleton joined the staff of the University of Wisconsin Medical School of which he became dean in 1935.

During World War I he was on active duty with the U. S. Army Medical Corps and served with the American Expeditionary Forces in Europe. His Victory Medal carries seven battle clasps. In World War II he

was Chief Medical Consultant for the European Theater where he served from June 1942 to July 1945.

He has been awarded the Distinguished Service Medal, the Legion of Merit with Oak Leaf Cluster, the Officer of the Order of British Empire (Military), and French Croix de Guerre with Palm.

His honorary degrees have been many: D.Sc. (1946), University of Pennsylvania, and D.Sc. (1950), University of Cambridge, England; LL.D. (1956), Temple University; L.H.D. (1957), Franklin and Marshall College; and Lit.D. (1958), Marquette University.

Dr. Middleton has served the Veterans Administration in a part time consultative capacity dating back to 1922. As Chief Medical Director he heads an agency with 171 hospitals and nearly 100 outpatient clinics that provides care for over two million patients each year.

### APPOINTMENT

Dr. Irvin J. Cohen has been appointed by the Veterans Administration as assistant chief medical director for planning. He succeeds Dr. William W. Fellows who has retired.

Dr. Cohen is a native of Brooklyn, New York. He received his Ph.G. degree from the School of Pharmacy at the University of Maryland in 1926, and the M.D. degree from that university in 1930. During World War II he served with the Army Medical Corps, and after his release in 1946 joined the Veterans Administration.

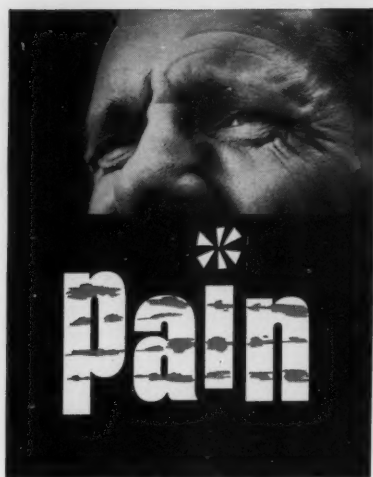
### APPOINTMENTS

Dr. John B. McHugh has been appointed as manager of the Wilkes-Barre VA Hospital, Wilkes-Barre, Pa. His previous position was that of manager of the Kansas City, Mo., VA hospital.

Richard G. Jones, who has been assistant manager of the Palo Alto, California VA hospital, has been appointed manager of the Hot Springs, S.D., VA center. From



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Ampuls 2 cc. (25 mg./cc.), boxes of 6; Tablets 25 mg., bottles of 50, and 100 mg., bottles of 500.

Dosage forms available on Federal Supply Schedule: Tablets 10 mg., 50 mg. and 200 mg.; Ampuls 1 cc. (25 mg./cc.); Multiple dose vials 10 cc. (25 mg./cc.); Syrup 10 mg./tsp. (5 cc.); Concentrate 30 mg./cc.; Suppositories 25 mg. and 100 mg.; Spansule\* sustained release capsules 30 mg., 75 mg., 150 mg., 200 mg. and 300 mg.



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\*T.M. Reg. U.S. Pat. Off.



May 1942 to December 1945 he served in the U. S. Army, and in April 1946 entered the Veterans Administration.

Dr. John M. Rumball who has been chief of medical service at the VA hospital in Coral Gables, Florida, has been appointed director of medical service for the VA at its central office in Washington.

A native of Rochester, New York, he received his medical degree from the University of Minnesota in 1935, after which he served his internship and residency in internal medicine at Rochester General Hospital. During World War II he was on active duty in the Army and now holds the rank of colonel in the Army Reserve Medical Corps.

Dr. Rumball has also accepted an appointment as clinical associate professor of medicine at Georgetown University School of Medicine in Washington, D.C.

#### TRAINING IN VA

Dr. Benjamin B. Wells, Director of the Education Service of the Department of Medicine and Surgery at the VA Central Office, Washington, D.C., stated that during 1958 the VA in cooperation with colleges and universities throughout the country had:

6,000 medical students—about 39 percent of the nation's third-year medical students and about 33 percent of its fourth-year medical students.

About 2,500 physicians becoming medical specialists as residents in psychiatry, general surgery, internal medicine, and 16 other fields. This is 11 percent of the nation's physicians in training as medical specialists during 1958.

70 dental interns and residents, or about 15 percent of the nation's dental interns and residents during 1958.

2,900 student nurses, or 10 percent of the student nurses graduated from the nation's schools of nursing in 1958.

Some 700 psychology trainees. This number represents 20 percent of the total graduate training in clinical and counseling psychology conducted during 1958 in affiliation with the 54 universities approved by the American Psychological Association.

281 occupational therapy trainees, or 59 percent of the nation's occupational therapy students graduated during 1958, and 430 physical therapy trainees, or 55 percent of the nation's physical therapy students graduated during 1958.

329 social work trainees, or 19 percent of the nation's 1958 graduates in social work.

85 dietetic interns and some 100 trainees in medical administration, pharmacy, audiology and speech correction, and other specialties contributing to medical care.

#### INSURANCE

A savings of up to two-thirds in their government insurance costs can be made by those veterans who served in the Korean and post-Korean period whose insurance policy numbers are preceded by the letters "RS".

These approximately 500,000 policyholders may exchange their present five-year term policies for new term policies that carry the same face value at a greatly reduced premium cost. These savings are made possible by a continuing improvement in mortality rate resulting from a lengthening of the life span.

The new policies are not renewable after the holder has passed his fiftieth birthday but must be converted to a permanent plan before that date if he wishes to continue protection beyond that date. In all other respects they carry the same protection of the present policies.

Both the present and the new term policies can be converted at any time, without physical examination, to a VA permanent-type plan.

Full information can be secured by contacting any VA office, or by writing the VA office to which premiums have been paid.

#### RETIRES

Dr. William W. Fellows, assistant chief medical director for planning, retired on March 26, from that position which he had held since 1955. He joined the Veterans Administration in 1931 after six years in private practice at Salisbury, Mo.

Dr. and Mrs. Fellows will live at 400 S.W. 25th Ave., Miami, Fla.

#### TUBERCULOSIS

Isoniazid alone was as effective as the administration of a combination of isoniazid and PAS for previously untreated pulmonary tuberculosis patients without lung cavities, according to a two-year controlled study by the Veterans Administration.

Previously untreated pulmonary tuberculosis patients with lung cavities responded as well to a two-drug combination as they did to a three-drug combination: isoniazid with PAS, or isoniazid with streptomycin. The addition of the third drug seemed to cause more drug reactions.

#### STREPTOMYCIN IN TUBERCULOSIS

Streptomycin pantothenate has no advantage over streptomycin sulfate according to the study of 237 tuberculosis patients in 13 of the Veterans Administration hospitals.

It was the hope that the pantothenate form of streptomycin would reduce hearing impairment and other undesirable effects of streptomycin treatment.

## National Guard

#### ENLISTMENTS

An increase of 11,000 young men without prior service may be enlisted in the National Guard until June 30. This was announced



U. S. Army Photo

#### 349TH GENERAL HOSPITAL, LOS ANGELES, CALIFORNIA

The 349th General Hospital is a 1,000-bed U. S. Army Reserve Unit of Los Angeles, California. This hospital has 309 officers and enlisted men, and is commanded by Colonel Adio A. Freeman, MC, USAR, a practicing psychiatrist in Beverly Hills and an Associate Professor of Psychiatry at the UCLA Medical School. Other officers are: Lt. Colonel William Jett, Executive Officer; Colonel Benjamin Klauman, Chief of Professional Services; Colonel Norman Brill, Chief of the Neuropsychiatry Service; Colonel Irving Schuman, Chief of Ophthalmological Section; Colonel Lester Fish, Chief of the Urology Section; Colonel Percy Parker, Chief of the Dental Service; Major Clifford Spears, Chaplain; Lt. Colonel Arline Skow, Chief of the Nursing Service; Captain Carroll Blodgett, Adjutant; Major Richard Hendricks, Unit Commander; and 1st Lt. John E. Coulson, Public Information Officer. On-the-job training was started in March at the Los Angeles County Hospital for one full Sunday each month. Two Thursday nights a month the members meet for training at their training center at 1350 San Pablo St., Los Angeles.

by the Department of the Army. Of this number 8,100 can be accommodated in the six months active duty training program.

#### PENTOMIC REORGANIZATION

The Army National Guard has started a nation-wide reorganization under the Pentomic concept, and will perpetuate its historic regiments through adoption of the Army's recently established "Combat Arms Regimental System" (CARS).

Conversion to CARS in the National Guard will be accomplished on a State-by-State basis, with each State selecting the regiments whose historic traditions it wishes to preserve.

### Miscellaneous

#### MASS CASUALTY CARE TRAINING

The seventh annual National Civil Defense Conference will be held in Atlantic City on Saturday, June 6, preceding the opening of the annual American Medical Association convention.

Brigadier General Harold C. Lueth, MC, USAR, chairman of the A.M.A. Committee on Disaster Medical Care has stated that "the one-day program will highlight medical problems involved in nuclear warfare."

The Army Medical Service will take an active part in the program. Topics to be discussed are: Casualty Estimation; First Aid, Self Aid, Rescue and Evacuation; Management of Burns Resulting from Nuclear Disaster; Chemical and Biological Warfare, and Psychological Aspects of Disease.

Major General James P. Cooney, Deputy Surgeon of the Army, said that the A.M.A. Conference, like the courses at Walter Reed Army Medical Center and Brooke Army Medical Center will be "directed to a positive approach in order to instill a feeling of hope in the resolution of foreseeable problems."

Information pertaining to registration may be obtained from Frank W. Barton, Secretary, Council on National Defense, American Medical Association, 535 North Dearborn St., Chicago 10, Ill.

#### CONFERENCE ON AGING

The first White House Conference on Aging will be held in Washington, D.C., in January, 1961. A three-day National Leadership Training Institute for this conference will be held at the University of Michigan, Ann Arbor, Michigan, beginning June 24, immediately following the University's 12th annual Conference on Aging.

The 1961 Conference will be concerned with such problems as employment, retirement, housing and health of people 45 and over, the number of which has increased from approximately 13½ million in 1900 to 49½ million in 1957.

#### AWARD FOR MONOGRAPH

*Modern Medical Monographs* announce the 1959 competition for unpublished manuscripts on clinical subjects in the field of internal medicine. First prize is \$500; top-ranking manuscripts found suitable for publication will be offered contract for publication of the manuscript in book form.

Author must be a physician under 40 years of age. Manuscript must not be more than 200 nor less than 130 typewritten pages, double spaced with one-inch margins, and no more than 30 illustrations. Follow Fishbein's book, "Medical Writing" (third edition).

October 1, 1959 is deadline for submission of manuscript by registered mail to Richard H. Orr, M.D., 33 East 68th St., New York 21, N.Y.

#### FOREIGN LANGUAGES

U.S. Commissioner of Education Lawrence G. Derthick has stated that the most critically needed foreign languages for study are: Arabic, Chinese, Hindustani, Japanese, Portuguese, and Russian.

These six languages are spoken by more than 1 billion people, or about 35 percent of the world's population.

#### TAX DEDUCTION

Graduate training expenses are deductible for income tax purposes. So ruled the Tax Court on an appeal from a ruling by the

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*V-Cillin K® (penicillin V potassium, Lilly)  
V-Cillin K® Sulfas (penicillin V potassium  
with triple sulfas, Lilly)*

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Commissioner of Internal Revenue. In so ruling the Court recognized the need of doctors to advance their professional knowledge by further educational courses even though they not be in their particular specialty.

#### RESEARCH EQUIPMENT EXHIBIT

The Ninth Annual Instrument Symposium and Research Equipment Exhibit will be held at the National Institutes of Health, Bethesda, Maryland, September 28 through October 1. For further information write to James B. Davis, National Institutes of Health, Bethesda 14, Md.

#### NUCLEAR ENERGY BOOKS

*Proceedings of the Inter-American Symposium on the Peaceful Application of Nuclear Energy (TID 7554)* contains the papers presented at the Inter-American Symposium held at the Brookhaven National Laboratory in May 1957. These can be purchased from the Office of Technical Services, U.S. Department of Commerce, Washington 25, D.C., for \$6. This is a set of two books containing 621 pages.

#### REPORTS AVAILABLE

*Urban Sprawl and Health*, a 228 page report of the 1958 National Health Forum is available from the National Health Council, 1790 Broadway, New York 19, N.Y., for \$1.75 per copy.

*Biology and Ultracentrifugal Methodology of the High-Density Lipoproteins and the Proteins of Human Serum (UCRL-8550)*; 91 pp., is available for \$2.25 per copy from the Office of Technical Services, U.S. Department of Commerce, Washington 25, D.C.

#### BOOK REVIEW

*Medical Education*—Annotated Bibliography (1946-1955), of the World Health Organization. This book is available through the International Documents Service, Columbia University Press, 2960 Broadway, New York 27, N.Y., at \$6.75 a copy.

A 391-page book, it gives brief annotations on approximately 2,500 references of the

world's literature on medical education for the period 1946-1955.

The book is divided into subject matter under which authors are listed alphabetically. There is also an index of authors. The work will be of particular interest to medical educators.

#### COLOR CODING

*Facts About Color Coding* represents the first compilation of current color coding practices. Copies of the booklet are available free from Becton, Dickinson and Company, Rutherford, N.J.

#### MEDICAL ELECTRONICS CONFERENCE

The Second International Conference on Medical Electronics will be held at the new UNESCO Building in Paris from June 24-June 27. Further information may be obtained from the Secretariat: 131, Boulevard Malesherbes, Paris XVII.

#### POSTGRADUATE COURSES

The American College of Physicians offers postgraduate courses as follows: *Cardiac Arrhythmias*, May 22-24, at Philadelphia General Hospital; *Psychiatry for the Internist*, June 1-5, at University of Maryland Hospital; *Special Topics in Internal Medicine*, June 15-19, at the University of Colorado School of Medicine; *Selected Topics in Internal Medicine*, June 22-26, at University of Cincinnati College of Medicine.

For further information address: The American College of Physicians, 4200 Pine St., Philadelphia 4, Pa.

#### POSTGRADUATE COURSES

New York University Post-Graduate Medical School offers the following courses: *Symposium on Modern Therapeutics in Internal Medicine* (June 8-19); *Clinical Gastroenterology* (June 22-26); *The Management of Chronic Kidney Disease* (June 22-23); *The Management of Hypertension* (June 24-25).

For further information address: Office of the Associate Dean, 550 First Ave., New York 16, N.Y.

## WORLD POSTGRADUATE TOUR

The fourth around-the-world postgraduate refresher clinic tour will be held this fall by the International College of Surgeons. Leaving San Francisco by plane in October the following cities will be visited: Tokyo (Oct. 18-19); Hong Kong (Oct. 29-30); Bangkok (Nov. 2); Tel Aviv (Nov. 20); Istanbul (Nov. 24); and Athens (Nov. 27). Return to New York December 1.

For further information write to the Secretariat, 1516 Lake Shore Drive, Chicago 10, Ill.

## MEETING

The National Society for Crippled Children and Adults will hold its 1959 convention at the Palmer House, Chicago, November 29 to December 2. Headquarters for this society are located at 2023 West Ogden Ave., Chicago 12, Ill.

## WHO PUBLICATIONS

Tuberculin	
Bull. Vol. 19/5/58	\$2.00
Malaria, Ecology of Snail and Anopheline Vectors	
Bull. Vol. 19/4/58	2.00
Mental Health Aspects of the Peaceful Uses of Atomic Energy	
TRS. No. 151/58	.60
Insect Resistance & Vector Control	
TRS. No. 153/58	.60
Rehabilitation	
TRS. No. 158/58	.60
Committee Report on Nutrition	
TRS. No. 149/58	.60
Delinquency, Pediatrics, Dental	
Ch. Vol. 12/10/58	.30
Air Pollution	
TRS. No. 157/58	.30

Any of above can be obtained from Columbia University Press, IDS, 2960 Broadway, New York 27, N.Y.

## New Members

Lt. Col. H. E. Archer, MSC, USA  
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Capt. Harold V. Stillwell, MSC, USA  
Scient. Ernestine Brown Bowen, USPHS-R  
Vet. Dir. Chester M. Hamilton, USPHS-R  
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Sr. Asst. Surg. Philip Nassau, USPHS  
1/Lt. Richard S. Colvin, MC, USA  
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Sr. Surg. John A. M. Thompson, USPHS-R  
(Inact.)  
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Col. Sidney Bressler, MC, USAR  
Col. R. R. Carbonetta, USAFR (MC)  
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H. S. Cowley, M.D.  
Capt. A. M. Gottlieb, MSC, USA  
J. V. Cardaro, M.D.  
A. Surg. Edwin R. Torres-Rodriguez, USPHS (Inact.)  
SA Surg. Theodore Cooper, USPHS-R  
Capt. Stephen M. Smith, MC, USN  
Capt. Warner H. Gustavson, USAF (MC)  
Sr. NO Barbara Hennigan Steffey, USPHS  
Sr. Dent. Surg. James J. Ailinger, USPHS

## Deaths

STRECKER, Edward A. emeritus professor of psychiatry at the University of Pennsylvania Graduate School of Medicine, died January 2, 1959, in the Jefferson Medical College Hospital, Philadelphia, Pa., at the age of 72.

A native of Pennsylvania, a graduate of Jefferson Medical College in 1911, he served in the rank of major in the Army Medical Corps as 28th division neuropsychiatrist with the American Expeditionary Forces in World War I. During World War II, he was consultant for the Army Air Force. He was awarded the Presidential Certificate of Merit for service as consultant to the Navy on January 16, 1948. He had served also as consultant to the U.S. Public Health Service and to the Veterans Administration.

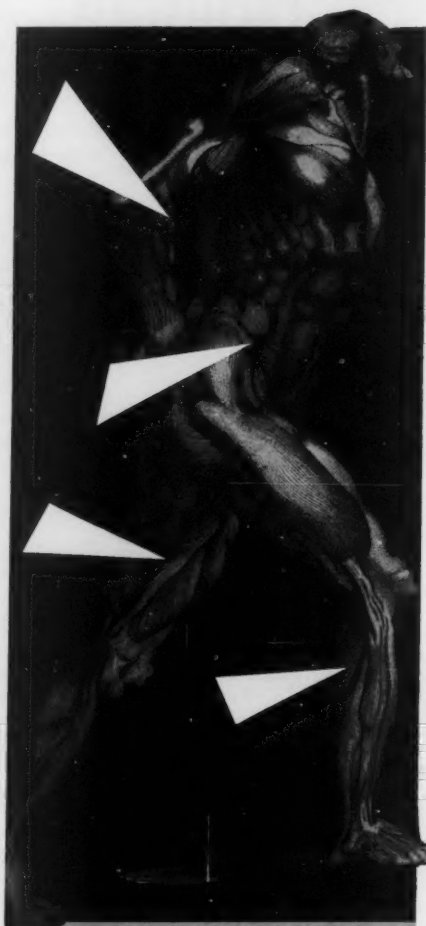
Doctor Strecker contributed many papers and several books to the subject of psychiatry.

MOSELEY, Harry G., Colonel U. S. Air Force Medical Corps, has been officially listed as having died in line of duty, following an aircraft accident (T-33 jet trainer)

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HCl and 1/300 grain atropine

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Beecher, H. K. (Harvard University Medical School): *Brit. J. Anesth.* 29:261, June, 1957

in the mountains in the vicinity of Norton Air Force Base, California. The aircraft has been missing since February 10, 1959.

Doctor Moseley, who was chief of the Aero Medical Safety Division, Directorate of Flight Safety Research, U. S. Air Force, was a native of Roanoke, Virginia and has received his B.S., degree from the University of Arizona in 1932, and his medical degree from Washington University School of Medicine in 1938. He entered the Army on July 5, 1939 and later transferred to the U. S. Air Force. A chief flight surgeon and a certified radiologist, he had served in many

important positions in the Department of Defense, the Office of the Surgeon General of the Air Force and at various Air Force bases.

Colonel Moseley was the author of a number of scientific papers, one of which was entitled "The Medical History of the Berlin Airlift." He held the Army Commendation Ribbon and was the 1958 recipient of the Raymond F. Longacre Award given by the Aero Medical Association.

He is survived by his widow and a son, Michael who reside at 1145 West Crescent Ave., Redlands, Calif.

## BOOK REVIEWS

SCIENCE AND PSYCHOANALYSIS. Vol. I—Integrative Studies. By Jules H. Masserman, M.D., Professor of Neurology and Psychiatry, Northwestern University of Chicago, and President, Academy of Psychoanalysis. 201 pages. Grune & Stratton, New York and London. Price \$5.75.

The Academy of Psychoanalysis came into being in 1956 "to develop communication among psychoanalysts and their colleagues in other disciplines in science and the humanities." This volume is the first publication of the scientific proceedings of the Academy. The papers are of a high level of originality and interest, the contributors directing their efforts toward the definition of psychoanalysis among the sciences, and an integration with anthropology, communication theory, various system theories, philosophy, biology, logic, and psychiatric therapy.

Rioch, in the first paper, deals with temporal factors, teleology, and symbolism in human transactions. Riese discusses the pre-freudian origins of psychoanalysis. Devereux and Kardiner attempt to define the relationship between psychoanalysis and anthropology, and Ruesch and Wiegert explore (with more success) the communication problems between doctor and patient, and between psychiatrists. Miller evaluates models of the mind and mental functions from Freud's constructs to those embodying cybernetic, information, and electronic concepts, and the "general behavior systems" of Bertalanffy, Parsons, et al.

Other discussions are by Grinker, Ehrenwald,

Hock, Appel, Bailey, Rado, Heath, and Janet MacKenzie Rioch.

The book is timely, scholarly, and valuable.

CDR. THOMAS H. LEWIS, MC, USN

REHABILITATION AFTER ILLNESS AND ACCIDENT.

Edited by Thomas M. Ling, M.D., M.R.C.P., Consultant Psychiatrist to Marlborough Day Hospital; and C. J. S. O'Malley, C.B.E., M.B., Medical Director, Camden Road Rehabilitation Center, England. 119 pages. The Williams & Wilkins Co., Baltimore, exclusive U.S. Agents. Price \$3.50.

Rehabilitation and resettlement of patients after illness and accident, as practiced in England, is discussed in this little book of 117 pages. The ten chapters written by personnel associated with St. Thomas's Hospital, either as consultants or as former students, divide the contents primarily into three parts: (1) Basic factors involved in rehabilitation, (2) Rehabilitation after specific disease entities, and (3) Administrative aspects of rehabilitation under socialized medicine.

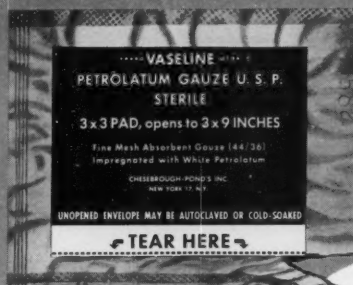
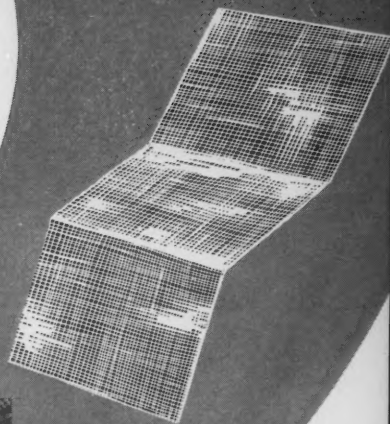
Some authors are opinionated and undoubtedly reflect the thinking at this one center.

This book can only be recommended as an interesting commentary on rehabilitation as practiced in England to those already versed in rehabilitation practice in this country. For factual information the recent American publications have much more to offer.

J. C. BRAY, M.D.



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**FEAR: CONTAGION AND CONQUEST.** By James Clark Moloney, M.D., Detroit, Mich. 140 pages. Philosophical Library, Inc., New York. Price \$3.75.

No one will dispute Doctor Moloney's arguments for better mother-child relationships nor the fact that the oriental mother is very close to her child. The methods cited by Dr. Moloney whereby fears are controlled by such relationship is certainly open to argument.

Do we ever get away from fears? It is a long distance from the mother's arms to the home for demented seniles. Dr. Moloney manages this in a stride and seems to ignore the possibility that much could transpire in the years between.

This book certainly is stimulating even if one cannot agree with the author on the means of conquering fear.

R. E. B.

## NEW BOOKS

Books may be ordered through this association.

*Medical Education, Annotated Bibliography 1946-1955*, World Health Organization, Palais des Nations, Geneva, Switzerland. \$6.75.

*Atomic Medicine*, Edited by Charles F. Behrens, M.D., F.A.C.R., 3rd Edition, The Williams & Wilkins Co., Baltimore, Md. \$15.00

*Textbook of Surgery*, Third Edition, Edited by H. Fred Moseley, M.A., D.M., M.Ch. (Oxon), F.A.C.S., F.R.C.S. (Eng.), F.R.C.S. (C), The C. V. Mosby Co., St. Louis, Mo. \$17.00

*The Symptom as Communication in Schizophrenia*, Editor, Lt. Colonel Kenneth L. Artiss, MC, USA. Grune and Stratton, New York, N.Y. \$5.75.

*Dangerous Marine Animals*, Bruce W. Halstead, M.D. Cornell Maritime Press, Cambridge, Md. \$4.00.

*Therapeutic Radiology*, William T. Moss, M.D., The C. V. Mosby Company, St. Louis, Mo. \$12.50.

*Cancer: Diagnosis and Treatment*, Edited by John B. Field, M.D., Ph.D., Medical Book Department, Little, Brown & Co., Boston, Mass. \$18.50.

*Group Psychotherapy, Theory and Practice*, Second Edition, J. W. Klapman, M.D., Grune & Stratton, Inc., New York, N.Y. \$6.75.

*Readings in Psychoanalytic Psychology*, Edited by Morton Levitt, Ph.D., Appleton-Century-Crofts, Inc., New York, N.Y. \$8.50

*The Army Almanac*, Edited by Brig. Gen. Gordon R. Young, U. S. Army, Ret., The Stackpole Company, Harrisburg, Pa. \$8.95.

*Diseases of Metabolism, Detailed Methods of Diagnosis and Treatment*, Edited by Garfield G. Duncan, M.D., W. B. Saunders Co., Philadelphia 5, Pa. \$18.50.

*The Psychiatric Aide*, Alice M. Robinson, R.N., M.S. J. B. Lippincott Co., Philadelphia, Pa., \$3.50.

*The Differential Diagnosis of Abdominal Pain*, Edited by Sherman M. Mellinkoff, M.D., McGraw-Hill Book Co., Inc., New York, N.Y. \$9.00.

*Instrumentation in Anesthesiology*, William H. L. Dornette, M.D., Verne L. Brechner, M.D., Lea & Febiger, Philadelphia, Pa. \$8.00.

*A Short Practice of Surgery*, Hamilton Bailey, F.R.C.S. (Eng.), F.A.C.S., F.I.C.S. FR.S.E. and McNeill Love, M.S. (Lond.), F.R.C.S. (Eng.), F.A.C.S., F.I.C.S. J. B. Lippincott Co., Philadelphia, Pa. \$18.00.

*The Effect of Pharmacologic Agents on the Nervous System*, Editor Francis J. Braceland, M.D., The Williams & Wilkins Company, Baltimore, Md. \$13.50.

*Surgery in World War II, Neurosurgery*, Volume I, Office of the Surgeon General, Department of the Army, Editor in Chief, Col. John Boyd Coates, Jr., MC, Superintendent of Documents, Government Printing Office, Washington 25, D.C. \$5.00.

*Surgical Pathology*, Lauren V. Ackerman, M.D., Harvey R. Butcher, Jr., M.D., The C. V. Mosby Company, St. Louis, Mo. \$15.00.

*What Every Air Force Wife Should Know*, Ester Wier, The Stackpole Company, Harrisburg, Pa. \$3.95.

*Total Surgical Management*, James D. Hardy, M.S., M.D., F.A.C.S. Grune & Stratton, New York, N.Y. \$9.50.

*A Doctor Discusses Menopause*, G. Lombard Kelly, M.D., The Budlong Press, 5428 N. Virginia Avenue, Chicago 25, Ill., Complimentary copy available to Physicians. Patient Price \$1.50.

*My 28 Years As An Army Nurse*, Major Gertrude S. Evert, A.N.C., Ret., Exposition Press, New York, N.Y. \$3.00.

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